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AN ILLUSTRATED MONTHLY TELEPHONE JOURNAL

VOLUME II.
NUMBER 3.

CHICAGO, SEPTEMBER, 1901.

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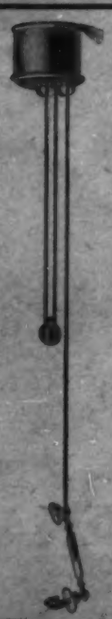

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Alphabetical Index to Advertisers, Page XIX.

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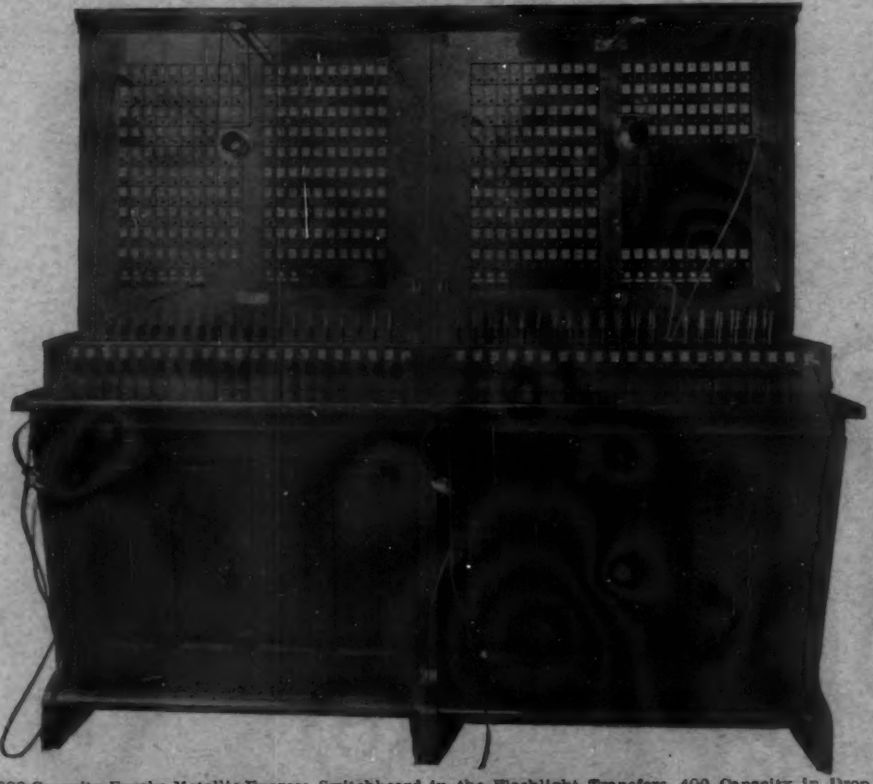

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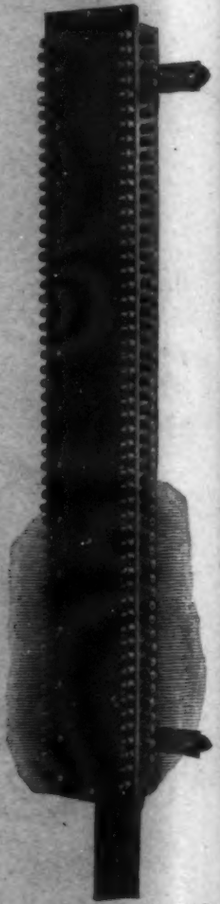

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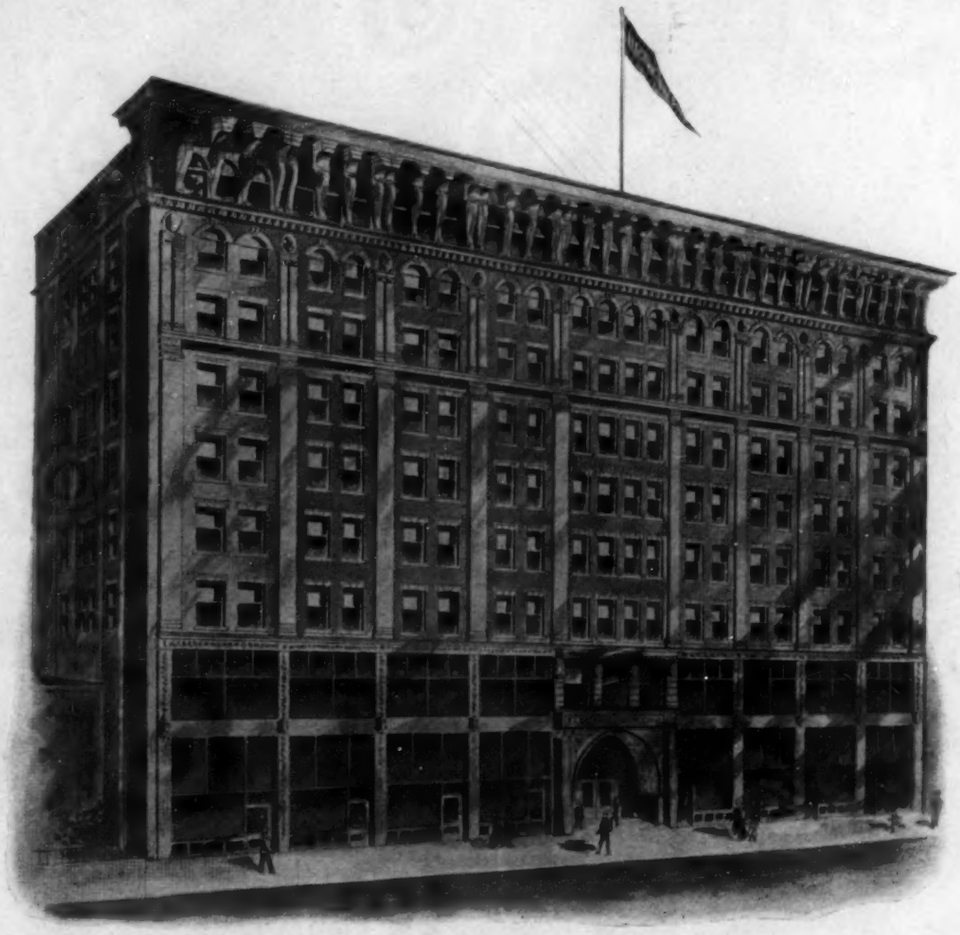
VOL. II. CHICAGO, SEPTEMBER, 1901. No. 3.

THE TELEPHONE STORY OF OHIO.

BY HON. H. D. CRITCHFIELD.

The growth of the Independent telephone interests in Ohio has been nothing short of marvelous.

In 1895 the Bell licensee companies combined had less than 28,000 telephones in the state, after having occupied the territory eighteen years. In the year last mentioned five or six Independent telephone plants were built in the state, notably at Norwalk, Mount Vernon, Chillicothe, Newark, Cambridge and Barnesville. These were the pioneer companies in Ohio, and really in the country at large. The members of these several corporations were active men in their respective communities—men who had the courage to face the Bell opposition, the threatened patent litigation, and the uncertainty, at that time, of securing reasonably satisfactory telephone apparatus. It is a rather remarkable fact that practically all of the gentlemen who were interested in these first companies have been continuously engaged in the telephone business since, and are now most prominently identified with it: Hon. James M. Thomas, the president of the Chillicothe Home Telephone Company and of the Independent Telephone Association of the United States, and now president of the Telephone, Telegraph & Cable Company of America, with headquarters in New York; H. D. Critchfield, connected with the Mount Vernon Telephone Company, secretary of the Ohio Telephone Association, general counsel for the Federal Telephone Company, with headquarters in Cleveland, Ohio, and general counsel for the Independent Telephone Association of the United States; Frank L. Beam, president of the Mount Vernon Telephone Company, now general manager of the Citizens' Telephone Company of Columbus, and vice-president of the Millersburg, Wooster & Orrville Telephone Company; Hon. Edward Kibler, president of the Newark Telephone Company, treasurer of the Ohio Telephone Asso-



HOME OF THE CUYAHOGA TELEPHONE COMPANY, CLEVELAND.

ciation, and a number of other men connected with Independent interests in the state.

From this beginning, in 1895, a system embracing more than 80,000 telephones, with more than 11,000 miles of pole

advent of the opposition. These telephone properties are owned jointly by local organizations, made up from among the best and most active men in each community, including, in almost every instance, one or more bankers. The money

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been rapid and far-reaching, until now the telephone facilities afforded to the people of this state are better and more comprehensive by far than had been dreamed of up to 1895.

Every town or city in the state of any consequence, except Cincinnati, is either built or building. In a majority of the counties every postoffice is reached by local toll lines connected with the exchange at the county seat or other principal town in the county. In fact, in many counties it is impossible for one to get thirty minutes' ride away from a telephone, try as he may. It has extended beyond this, and during this year the farmers in every section of the state are having telephones placed in their residences, connected with the local exchange, giving them access to their local markets and business center. How far this growth will extend no one knows, but the writer believes that at least one farmer in four within this state will have a telephone in his residence within the next three years. The principal towns which have not yet been developed, but which are now building, are Toledo, Dayton, Springfield and Hamilton. With the contracts for service already taken in these places it is entirely safe to say that the number of telephones in the state, excluding all other growth, will be increased by 12,000 when the plants in these cities are in operation—within a year.

A similar growth has taken place in the territory adjacent to Ohio, notably in western Pennsylvania, New York, West Virginia, Kentucky, Indiana and Michigan.

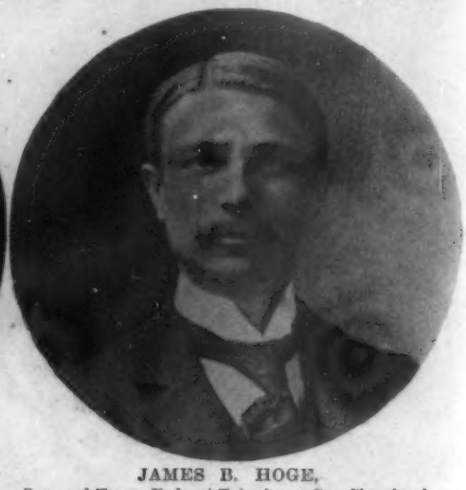
It became apparent to all those interested in the movement that for the preservation of the business and the satisfactory handling of the same, it was necessary to have some one company or concern which should build and operate long-distance lines connecting all of the Independent telephone exchanges and systems in Ohio with each other, and with like systems in adjacent territory. For this purpose and to this end, the United States Telephone Company was organized in Cleveland, with a capital stock of $2,000,000. It has built in Ohio more than 2,700 miles of pole lines, of first-class construction, 42, seven-inch top, 30-foot poles, to the mile. It has secured either private right-of-way or the consent of the owners of property abutting upon the highway upon which such lines are located throughout the entire distance; has made 99-year exclusive contracts for the handling of business with the Independent telephone exchanges or systems with which it connects, and has strung more than 12,000 miles of copper wire for the transmission thereof. It might here be noted as a significant fact that from July, 1900, to July, 1901, the earnings of this property more than doubled—each month showing an increase over the next preceding month in substantially the same proportion as other months. In addition to this the United States Telephone Company has built a line through Toledo, Ohio, by way of Adrian, Jackson, Lansing and Owasso to Saginaw, Mich., and has entered into a contract with the companies operating all of the Independent telephones in the lower peninsula of Michigan for the exclusive handling or interchange of business with them for twenty-five years. This line, as located, taps and connects with the telephone

MAIN SWITCHBOARD CUYAHOGA TELEPHONE COMPANY, CLEVELAND.

systems of Michigan, which since the contract was executed, have been built with reference to facilitating the interchange of business between the different systems. It also connects with the Indiana systems at Fort Wayne, and is now building a line from Columbus, Ohio, westwardly to Richmond, Ind., where it will connect with the lines of the new long-distance company of Indiana, which occupies substantially the same relation to Indiana that the United States Telephone Company does to Ohio, thus giving it access to and connection with almost twice as many telephones and users in that state as can be had over all other lines. It connects with the Kentucky system at Ashland, Ky., and is now building a line to Parkersburg, W. Va., where it is under contract with the long-distance systems of West Virginia for the exchange of business for ninety-nine years. It is also completing a line from Cambridge, Ohio, east to Wheeling, W. Va., and it has in operation a line from Cleveland to Pittsburg, where it connects with the system of the Pittsburg and Allegheny Telephone Company, operating exchanges in Pittsburg and Allegheny, and the West Penn Long-Distance Telephone Company, which is doing a toll line business between the Independent companies of western Pennsylvania. It connects with the Union Telephone Company of Erie, Pa., at Conneaut, Ohio, and is now

EDWARD W. MOORE,
Vice-President Federal Telephone Co., Cleveland.

HENRY A. EVERETT,
President Federal Telephone Co., Cleveland.



JAMES B. HOGE,
Sec. and Treas. Federal Telephone Co., Cleveland.

H. D. CRITCHFIELD,
General Counsel Federal Telephone Co., Cleveland.

JAMES M. THOMAS,
Prest. National Independent Telephone Assn.

MARK DAVIS,
Gen. Manager Cuyahoga Telephone Co., Cleveland.

H. A. LANMAN,
President Citizens' Telephone Co., Columbus.

FRED DE LAND.
Treasurer Federal Telephone Company, Pittsburg.

FRANK L. BEAM,
Gen. Mgr. Citizens' Telephone Co., Columbus.

procuring the right-of-way under an arrangement with the other Independent occupants of that field, in northwestern Pennsylvania and northwestern New York, directly along the line of the Lake Shore & Michigan Southern Railroad to Buffalo, at which point it will connect, under contract, with the Inter-Ocean Telephone Company, a long-distance

GEORGE C. STEELE,
Secy. and Treas. North Electric Co., Cleveland.

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H. L. KNIGHT,
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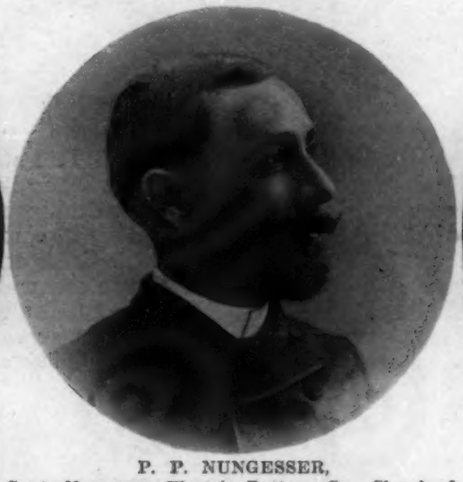

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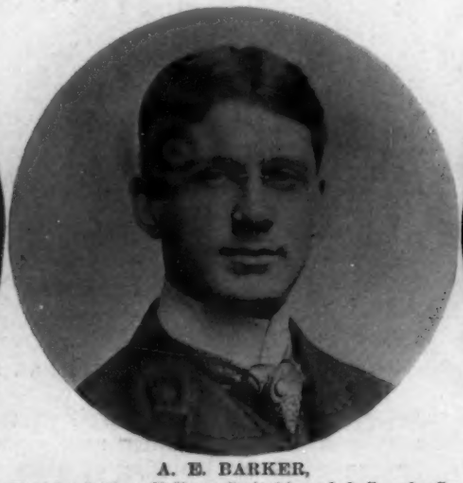
Supt. Nungesser Electric Battery Co., Cleveland.

JOHN P. DOWNS,
Engineer North Electric Company, Cleveland.

BERT G. HUBBELL,
Pres. Century Tel. Construction Co., Cleveland.



A. E. BARKER,
Cleveland Mgr. Kellogg Switchboard & Supply Co.

BYRON L. MOORE,
Asst. Mgr. Century Tel. Const Co., Cleveland.

company which is building Independent toll lines throughout New York state as far east as White Plains, at which point it will connect with the lines of the Telephone, Telegraph & Cable Company of America, with headquarters in New York, thus gaining entrance to New York City and the system being built by the latter company, which will also provide facilities for business with Boston and all intermediate points.

The United States Telephone Company is one of the subsidiary organizations controlled by the Federal Telephone Company, with headquarters at Cleveland, Ohio. The last named company has a capitalization of $10,000,000 and owns a controlling interest in the stock of the Cuyahoga Telephone Company, operating in Cleveland and Cuyahoga county; the Citizens' Telephone Company, operating in Columbus and Franklin county; the Portsmouth Telephone Company, operating on the Ohio River, at Portsmouth, Ohio; the Youngstown Telephone Company at Youngstown, Ohio; the

Stark County Telephone Company, operating exchanges in Canton, Massillon and Alliance; the Columbiana Telephone Company, operating more than 2,000 telephones in Columbiana county, Ohio; the Akron People's Telephone Company at Akron, and other Independent telephone exchanges at Lancaster, Galion, Shelby, Mansfield, Zanesville, Logan, Findlay, Lima, Bowling Green, Fostoria and numerous smaller towns and villages in Ohio, and is now building in Dayton, Ohio, and Detroit, Jackson, Ypsilanti and Ann Arbor, Mich.

In all these towns and communities there are local boards of directors and local officers, largely interested as stockholders, and, as above stated, made up from among the best, most active and representative men in each community.

LOUIS SANDS,
President Williams-Abbott Electric Co., Cleveland.

HARRY C. DODGE,
Gen. Mgr. Williams-Abbott El. Co., Cleveland.

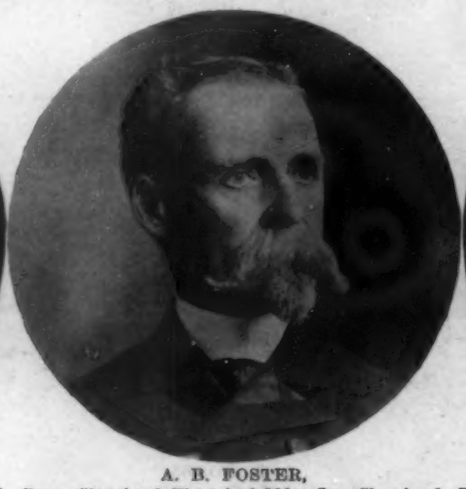
W. P. BOWMAN,
Cleveland Mgr. John A. Roebling's Sons Co.

The Federal Telephone Company represents what is known as the Everett-Moore Syndicate of Cleveland, Ohio, of which Henry A. Everett—probably the most prominent street railway man in the world to-day—is the president. E. W. Moore, Mr. Everett's closest and most confidential associate, is vice-president. James B. Hoge, prominent in telephone, banking and financial circles, is secretary and treasurer. H. D. Critchfield, who has been prominently identified with the Independent telephone movement from the beginning, and has had many years' experience as a corporation lawyer, is general counsel, and Maxine Reber, one of the best known telephone and electrical engineers in the country, is consulting engineer and general manager.

The United States Long Distance Telephone Company does not do any local telephone business, thus avoiding any conflict with the local concerns with which it connects at the principal exchange points, all business being brought in to the principal exchange point by the local company over its own line, and there delivered to the United States Company for transmission, and incoming business being delivered to the local company at its principal exchange point for transmission to its point of distribution over the local lines. In this way the most perfect harmony prevails and the best results can be obtained, as the local company, by reason of its local influences and thorough knowledge of local conditions can best develop the local territory, thus securing the largest volume of business and handling it in the most satisfactory manner to its patrons.

The exchange at Toledo is being built by the Central Construction Company, the moving spirits of which are Messrs. E. L. Barber and James S. Brailey of Wauseon. These gentlemen have built a large number of Independent telephone exchanges in Ohio, and other states. Their work is noted for its completeness and the excellence of the material used. This assures a perfect plant in Toledo, and that the people are with the new company there, is evidenced by the fact that already they have secured more than 4,000 contracts for service. The United States Telephone Company is building a line between Toledo and Detroit, and from Detroit westwardly to Lansing, thus affording ample facilities and opportunity for the speedy and satisfactory handling of Michigan business to points beyond the state. It is also extending a line from Toledo westwardly to South Bend, Ind.

E. F. KANEEN,
Secy. and Treas. Am. Toll Tel. Co., Cleveland.



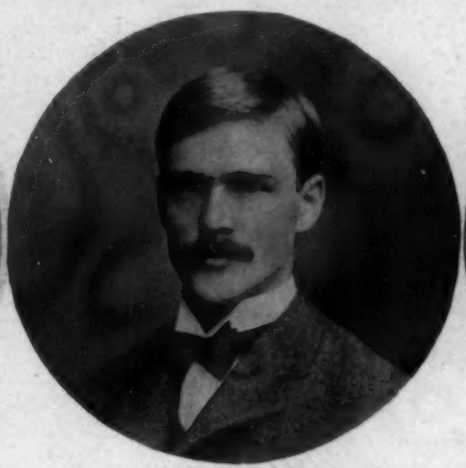
A. B. FOSTER,
Pres. Cleveland Electrical Mfg. Co., Cleveland.

W. A. FOSS,
President Am. Toll Telephone Co., Cleveland.

Perhaps one of the most striking illustrations of the favor with which Independent telephone companies are received is the success which has attended the Citizens' Telephone Company of Columbus, Ohio. This company was organized in January, 1899, and is officered as follows: President, Henry A. Lanman, president of the Columbus

Machine Company and of the Columbus Bolt Works, and prominently identified with numerous banks of the Capital city, and one of its most reputable citizens. Secretary and treasurer, Edwin R. Sharp of the City Savings Bank and Trust Company of Columbus, recognized as one of the most conservative and successful business men of the city. Counsel, Frank A. Davis, whose reputation as a business lawyer is probably second to none in Columbus. General manager, Frank L. Beam, above-mentioned, and whose reputation is too well established to require comment. The directors of this company are: Henry A. Lanman, Edwin R. Sharp,

JOSEPH A. WILLIAMS,
President Williams Electric Company, Cleveland.



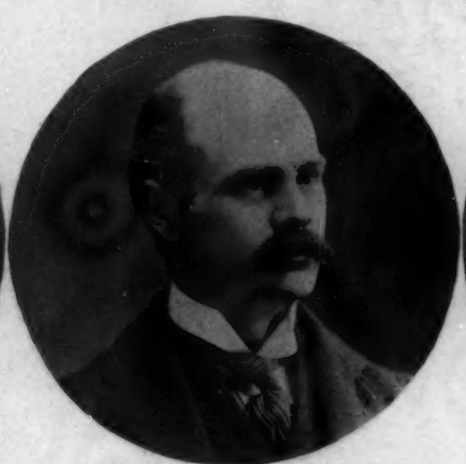
W. J. BARR,
Manufacturer, Cleveland.

J. A. STRATTON,
Superintendent Williams Electric Co., Cleveland.

H. A. Everett, E. W. Moore, James B. Hanna, H. D. Critchfield, James M. Thomas, James B. Hoge, and William A. Hardesty.

At the time that steps were first taken to organize this company, there were less than 1,800 telephones in this city, with a population of approximately 125,000 people. After a protracted struggle, and encountering and overcoming all the difficulties and obstructions which could be placed in its way, a franchise was granted to the Citizens' Telephone Company early in June, 1899, and the work of construction

EDWIN R. SHARP,
Secy. and Treas. Citizens' Tel. Co., Columbus.



A. E. DOBBS,
Electrical Engineer, Cleveland.

FRANK A. DAVIS,
Attorney Citizens' Telephone Company, Columbus.

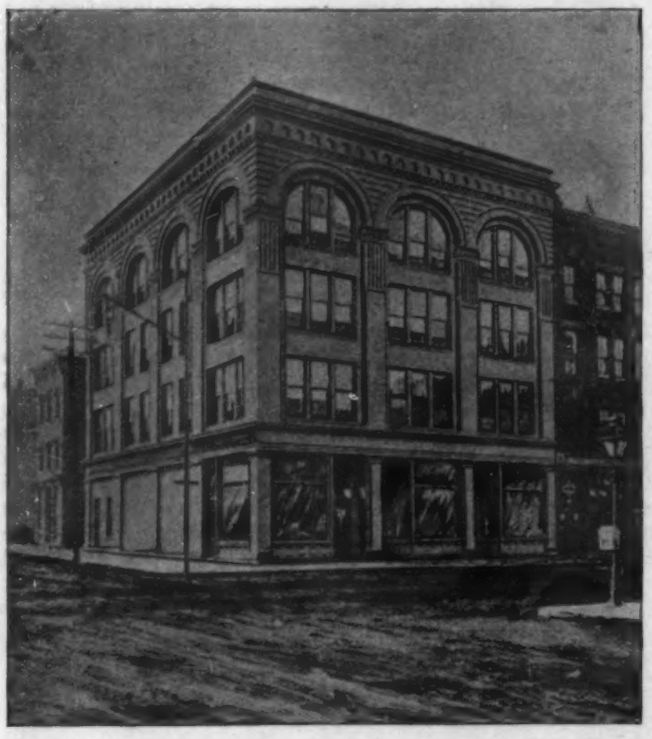
commenced on the 9th day of the same month. The plant was put into service with about 3,200 telephones, on the 1st day of August, 1900. It has to-day 5,543 telephones working, and is growing at the rate of more than 200 a month. The average number of calls per telephone in this plant has reached a point of more than 14 per day—a figure which is so far above the average under the old conditions that it is almost beyond belief, and more than anything else attests the popularity of the new service. This growth and success is due to several causes: First, the natural dislike of the public to any concern which has had undisputed possession of the field for a long term of years. Second, the high standing and known integrity, in Columbus, of the gentlemen who constitute the company. Third, the excellence of the service and the willingness to accommodate the public and make the service useful and convenient to it. That this has been done is evidenced by the fact that the physicians, retail grocers and numerous other trade organizations declared unanimously in favor of but one telephone, and that the Citizens'. The present capacity of the plant is substantially exhausted, and contracts have been left for an increase of more than 3,000 additional lines.

What is true of Columbus is true elsewhere, but Columbus was specially referred to because it is the state capital, the seat of the offices of the organization of the Bell Licensee Company operating in that territory, and the home, for many years, of some of the principal officers of the organization. It was considered the key to the situation, and the fight there was as vigorous and comprehensive as it was possible for them to make it. It is a remarkable fact, but it is true, that out of more than 340 Independent telephone companies in Ohio, with more than 5,000 stockholders, the great majority of whom knew nothing about the business when they first went into it, but took it up as a side issue, there has been but one failure, and every other company is making money and earning satisfactory returns on the investment.

That Ohio has kept pace with the general development is shown by the fact that there are to-day in the United States approximately 980,000 Bell telephones, as shown by the report of the president of that organization at its last annual meeting, while there are more than 1,800,000 Independent telephones. The Bell licensee companies now

have in the state approximately 55,000 telephones, while the Independents, as before stated, have more than 80,000 telephones. But it is safe to say that with the developments now taking place in the cities not heretofore opened to the Independents, which had been occupied by the Bell people for many years, and the growth in existing Independent companies' properties, the system in Ohio will number more than 100,000 by the first of July, 1902.

When we consider that at the time the Independent telephone movement was started it was the popular belief that all basic principles of telephony were covered by patents owned and controlled by the company then operating, which threatened infringement suits and unending litigation, not alone against the companies which sought to develop opposition properties, but against the users of the telephones themselves, with circular letters and paid agents sent to localities where Independent sentiment was developing; with substantially all persons skilled in the art of making telephones or repairing the same or maintaining a telephone



HOME OF THE COLUMBUS (OHIO) CITIZENS' TELEPHONE COMPANY.

system in the employ of the then operating company, no other field having then been opened for their employment; that the Independent telephone companies had to not only meet these obstacles, but as a matter of fact had to educate the men out of raw material, to make the machines to make the telephones with, and then to educate the public that they could make telephones that could talk and could give satisfactory service; in the face of all these things the growth of the business has certainly been phenomenal.

As to its future, the basis of organization in the state is such that it seems nothing can prevent its continuous healthy growth and development. There are more than 340 companies, composed of from three or four to 50 stockholders each—generally 12 or 15—men prominently identified with the business and social life of the community in which they reside, and in which their telephone business is done; the Independent telephone manufacturers are now making better apparatus than had been turned out prior to 1895, and as good as is being manufactured anywhere in the world to-day; the management of these companies is local, and in the hands of people in touch with the wants of each community; there exists a perfect understanding between neighboring companies as to the territory each has or occupies, and its connections; they are bound together by ninety-nine-year contracts with a long-distance company which is furnishing as good long-distance service as the state of the act will permit, and is reaching more than 1,200 toll points in Ohio to-day, as compared with less than 600 reached by all other companies; the rates charged by them for local and long-distance service are lower than the rate charged for like service by the old company (except as a war measure)—in other words the rates fixed by the Independent companies are, as a rule, just at that point at which good service can be given and the plant properly maintained at a fair profit to the investor, and a lower rate than this must be but temporary or calamitous; a higher rate than this would ultimately be ruinous. And having reached that point at which they can serve the public well, while making a reasonable profit on the investment, the public is not disposed to wander after strange Gods, and leave a satisfactory service at a fair price, which is much less than the price for which they received a less satisfactory service prior to the coming of the Independents. The public knows—anyone knows—that business will not be permanently done at a loss, and the business man in competition in any line who has fixed his price so low that none can go below him and continue to do business at a lower rate, and yet at a price that affords him a fair return on the investment, is the one who will, so long as he maintains the standard of that which he sells, retain the patronage and good-will of the public which he serves; and fortunately for the Independents that is the position which they have assumed. In view of all these things, therefore, it seems but reasonable to suppose that the growth of the past, and the support of the public, especially where the opposition have, in many instances offered absolutely free service for years and years, or have offered service as low as $6 a year—which all who are advised on the situation know is less, much less, than the cost of maintaining equipment and furnishing satisfactory service—will continue with the Independents, and that they, in order to maintain their supremacy so quickly gained, need only be watchful and vigilant, and serve the public in a satisfactory manner.

I believe that the telephone business of the United States is yet in its infancy, and that within the next few years the number of telephones in use will be quadrupled. If I may be permitted to digress, or rather enlarge the scope of this article for a moment, I would say, that in my opinion there is no line of business which will so well withstand the vicissitudes of a stringent money market—"hard times" so-called—as the quasi-public utilities, light, heat, local transportation and telephones. A telephone once in use is a fixture. Many have tried to get along without it, but few, very few, have succeeded after once having used it, and have ordered it returned. When it becomes a question of economy and the cutting down of expenses in the household or business affairs, one of the very last things that will be considered will be dispensing with the telephone. It is not a convenience; it has become a necessity, and the more there are of them the more necessary it is. A telephone is much more necessary now than it was five years ago, and it will be much more necessary five years hence than it is now. For these reasons it would seem entirely safe to assume that there is no business in which the income can be more certainly depended upon than the telephone business.

A ten-mile telephone line and a modern telephone system for local use in a northern town in British Columbia is the latest step towards civilization that the twentieth century Indians of Kishpieaxe village on the Skeena river are arranging. The telephone wires and accoutrements were taken north by the steamer Tees, and the system will be installed under the care of the Rev. Mr. Pearce, the Methodist missionary. In a very short time it will be possible for the Indians at the end of the telegraph line at Hazleton to telephone to their brothers in the village ten miles further on. Kishpieaxe is by far the largest village in that vicinity, having a population of over 600.

WELL-KNOWN HEADS OF WELL-KNOWN HOUSES.

A BIOGRAPHICAL SKETCH OF CHARLES HOWARD NORTH.

Mr. Charles Howard North, president of the North Electric Company, Cleveland, and the subject of this sketch, was born in Ohio April 6, 1860. Shortly after this date the family moved to East Berlin, Conn., where Mr. North attended the public school, finishing his education at Oberlin College. At the age of twenty he taught school at Greenwich, Ohio, after which he entered the employ of the Akron, Canton and Massillon Telephone Company at Akron, Ohio. This was a local company which was afterwards sold to the old Midland Telephone Company, the predecessor of the Central Union Telephone Company. Resigning this position Mr. North entered the employ of the Brush Electric Company of Cleveland, after which he connected himself with the Cleveland Telephone Company, commencing as inspector. The word inspector, used in connection with telephone work, was coined at this time. Mr. North remained with the Cleveland Company six years, most of which time he had full charge of the company's switchboards. In 1885 he entered into partnership with Mr. George W. Drumheller, under the firm name of Drumheller & North, conducting an electrical repair shop. He succeeded to the company in 1889 and changed the name of the company to the North Electric Works. In 1889, in association with Mr. George C. Steele, he incorporated the North Electric Company. Under the management of Messrs. North & Steele the company forged rapidly to the front, and from a small repair shop on a side street it has become one of the prominent manufacturing concerns of Cleveland, employing over 300 hands, and has a capitalization of $200,000. The present plant of the company is one of the most modern in the country, and the North apparatus is in use in every state in the Union, as well as in Canada, Mexico and foreign countries. The officers of the company are Charles H. North, president; D. B. Wick, vice-president; George C. Steele, secretary and treasurer. The directors are: Charles H. North, D. B. Wick, George C. Steele, E. B. Bartlett and H. H. Johnson. Mr. North enjoys a very wide acquaintance both in the Independent and Bell ranks, is a man of strong personality, courteous, and an inventor of note. He has made his way to the front rapidly and is to-day one of the most prominent men in the Independent telephone manufacturing field.

CHARLES HOWARD NORTH.

FACTORY OF W. J. BARR.

Perhaps no person in the manufacture of telephone parts has given so much attention to the transmitter arm as W. J. Barr of Cleveland, Ohio. It is claimed that Mr. Barr made the first "concealed cord arm" and gave it that name, but when he first presented it to the different telephone manufacturers they did not approve of it altogether; but when the conductor cord, used then on the outside of the solid arm, proved to be a source of trouble, the hollow arm came into greater favor.

CORNER OF ASSEMBLING DEPARTMENT.

SECTION OF MACHINE ROOM.

In the beginning of the Independent telephone movement the transmitted arm was particularly neglected and many troubles were traced to a defective arm joint. Mr. Barr therefore constructed joints of arms and base to employ springs, thereby securing perfect contact; and, since the telephone manufacturers are using two conductor cords instead of depending on the joint of the arm for a contact, Mr. Barr

still uses a spring lug, which serves to make the arm rotate smoothly and also takes up the wear automatically, rendering a screw thumb nut unnecessary.

Mr. Barr owns several patents on construction and designs of telephone arms, and it may be mentioned here that on August 27 he brought suit in the United States Circuit Court against a manufacturer at Cleveland for infringing some of these patents, and it is said to be the beginning of a series of suits of the same character.

Mr. Barr's factory—sections of the machine and assembling departments of which are herewith shown—is devoted entirely to the manufacture of telephone arms, and with specially constructed machinery he is able to produce high grade goods at a minimum cost. The profit of this work lies in the fact that concentration of this special line makes it possible to place large contracts for castings at a very low price; an idea of this might be given by stating that on August 12 Mr. Barr placed an order for 100 tons of arm castings, to be taken within six months. The cast iron arm is a feature of the telephone apart from the electrical manufacture as precisely as is the wooden cabinet.

About a year and a half ago Mr. Barr conceived the idea of a complete cast iron cabinet for the central energy telephones. It is made entirely of iron and finished in black or maroon enamel, with gold striping. Exclusive designs can be made to suit any requirements. Mr. Barr is one of the younger manufacturers who has built up a large business through the intrinsic merit of his product and careful business management.

AN OHIO SUPPLY HOUSE.

The Cleveland Electrical Manufacturing Company, Cleveland, Ohio, is one of the largest electrical and telephone supply houses in the state of Ohio. It was incorporated in

GENERAL SALESROOM CLEVELAND ELECTRIC SUPPLY COMPANY.

1880 and its growth has been rapid. The company occupies two floors and basement at 45-47 Sheriff street. A view of the general salesroom is herewith shown. The company's officers are: A. B. Foster, president and general manager; M. M. Hobart, vice-president, and W. C. Walker, secretary.

NEW INDEPENDENT EXCHANGE FOR TOLEDO.

The greatest victory for the Independent telephone companies in Ohio, in some time, is said to be the securing by the Toledo Home Telephone Company of a franchise to build a local system. The company was promoted by Mr. Frank Graves, backed by Cleveland and Toledo people, and for some months it has been engaged in a struggle with two rival companies. Several weeks ago, after finding it impossible to gain any satisfaction from the city council, the company applied to the probate court, which finally granted the franchise. The new company had secured over 3,500 subscribers and the court was impelled to answer its demands. The company produced witnesses from every town in northwestern Ohio, who declared they were turning their business to Cleveland and Indianapolis, because they could not secure good long-distance telephone connection with Toledo merchants. Toledo already has two systems, and for that reason it was extremely difficult to secure the franchise. The Bell Company, it is said, has only about 1,200 subscribers, while the Harrison Company, which is supposed to be controlled by the Bell Company, and is not recognized by the Independents, has only about 500. The Toledo exchange forms a most valuable addition to the Independent interests in Ohio, as it will be a means of giving them first-class connection between the systems of Ohio and Michigan.

THE WILLIAMS-ABBOTT ELECTRIC COMPANY.

Factories No. 1 and No. 2 of the Williams-Abbott Electric Company of Cleveland are shown in the accompanying cuts.

This company was organized for the purpose of manu-

WILLIAMS-ABBOTT ELECTRIC COMPANY'S PRINCIPAL FACTORY AND GENERAL OFFICES, CLEVELAND.

facturing telephone apparatus nearly five years ago and is to-day one of the most important factors in its line in the Independent telephone field; its plant has within the past year been renovated and remodeled, new and improved machinery has been added to increase the productive capacity

WILLIAMS-ABBOTT ELECTRIC COMPANY'S BRANCH FACTORY, CLEVELAND.

and about 300 hands are employed. The company has recently gotten out quite an elaborate catalogue, showing a very complete line of appliances, including new and improved types of complete telephones, magneto bells of which they have always made a specialty, transmitters, receivers, power

WILLIAMS-ABBOTT ELECTRIC COMPANY FACTORY, CLEVELAND, O.

Automatic Machines and Assembling Room.
Punch Press Room.
Tool Room.
Plating Room.
Portion of Machine Shop.
General Offices.
Shipping Room.
Section of Stock Room.
Section of Stock Room.
Drafting and Engineering Department.
Polishing Room.
Transmitter Room.
Testing and Wiring Room.
Receiver and Assembling Room.
Winding Department.
Ware Room.
Blacksmithing and Magnet Bending Room.

generators, desk and test sets, lightning arresters and switchboards.

The Williams-Abbott standard metallic circuit switchboard, employing the H. C. D. patented self-restoring drop, embraces up-to-date improvements, and numerous orders are being received for these boards, which are furnished for use in connection with magneto call and central energy call systems. A complete line of toll and combination toll, party line and local exchange switchboards, lightning and heavy current arrester, distributing, change and test boards are also manufactured.

The active management of the company is in the hands of Mr. Lewis Sands, the president, and Mr. Harry C. Dodge, the general manager, than whom no two men are better known in the Independent telephone manufacturing field. The success of the Williams-Abbott Company is due entirely to their untiring efforts and managerial ability.

AMERICAN TOLL TELEPHONE COMPANY FACTORY.

The American Toll Telephone Company, Cleveland, Ohio, is one of the largest manufacturers of telephone pay stations and measured service devices in the United States.

GENERAL OFFICES AMERICAN TOLL TELEPHONE COMPANY, CLEVELAND.

The company was incorporated in April, 1900, with a paid-up capital of $10,000. Mr. W. A. Foss is president of the company and Mr. E. F. Kaneen is secretary and treasurer.

AMERICAN TOLL TELEPHONE COMPANY FACTORY, CLEVELAND.

Mr. Foss, who is the company's mechanical engineer as well as president, has been a manufacturer of coin-operating machines for a great many years and is one of the pioneers in the business. The first-class apparatus turned out by this company is due to his inventive ability. Mr. Kaneen, who has charge of the financial interests, and the business man-

AMERICAN TOLL TELEPHONE COMPANY FACTORY, CLEVELAND.

agement of the company, was for eight years connected with the Lorain Savings and Banking Company, Lorain, Ohio,

AMERICAN TOLL TELEPHONE COMPANY FACTORY, CLEVELAND.

as cashier, succeeding Mr. J. B. Hoge, now chairman of the executive board of the Federal Telephone Company. Both

AMERICAN TOLL TELEPHONE COMPANY FACTORY, CLEVELAND.

Messrs. Foss and Kaneen are young men, and the success of their company is due entirely to their knowledge of the business and shrewd management. A number of views of

the company's factory are shown, and, while the American Toll Telephone Company has been organized a little over a year, the floor space has been increased three times, and now

AMERICAN TOLL TELEPHONE COMPANY FACTORY, CLEVELAND.

covers 10,000 square feet of space. The company's apparatus is in use by nearly all the large telephone companies and is meeting with universal satisfaction.

WILLIAMS ELECTRIC COMPANY, CLEVELAND.

The Williams Electric Company of Cleveland, Ohio, was organized in May, 1898, with twenty-five thousand dollars capital stock. In February, 1899, the capital stock was increased to fifty thousand dollars. This company was organized for the purpose of manufacturing magneto bells, receivers, transmitters or complete telephones and telephonic and electrical appliances of all kinds.

The present officers of the company are Mr. J. A.

SECTION OF MACHINE DEPARTMENT WILLIAMS ELECTRIC COMPANY, CLEVELAND.

Williams, president and general manager; Mr. W. D. McTighe, secretary and treasurer, and Mr. H. M. Dillhoeffer, vice-president.

Mr. J. A. Williams, president and general manager, is a practical and thorough telephone man, having established the Williams-Abbott Electric Company in 1895 and disposed of his interests in that company in 1898 and then organized the Williams Electric Company. To Mr. Williams is due the manufacture of the first complete Independent telephones in the state of Ohio.

The company is well equipped with the most modern machinery for the accurate and rapid production on the interchangeable basis of telephone parts. It has a rigid system of gauging and inspection of every part that enters into their product. The company has recently added a switchboard department and is now manufacturing switchboards and equipping exchanges complete. One of the company's specialties is the manufacture of very powerful long-distance toll line instruments. Its bridging telephones are made in four grades of resistance, namely: 1,000 ohm, 1,600 ohms, 2,500 ohms and 3,500 ohms.

SECTION OF MACHINE DEPARTMENT WILLIAMS ELECTRIC COMPANY, CLEVELAND.

Mr. J. A. Stratton is the superintendent of the company. Mr. Stratton is a thoroughly experienced and up-to-date telephone man and to him is largely due the perfect working of the system of gauging and inspecting parts.

This company operates under the old and successful policy that "What is worth doing at all is worth doing well."

A few views of the machine department of the Williams factory are shown.

INDEPENDENT TELEPHONE ASSOCIATION OF MISSISSIPPI.

At a meeting of the executive committee of the Independent Telephone Association of Mississippi held at Tupelo, Miss., on August 7, J. A. Richmond of Columbus, Miss., was elected president of the association and chairman of the executive committee, to fill the office made vacant by the death of president Hugh Campbell of Aberdeen, Miss. President Richmond was instructed to make the necessary arrangements and issue a call for the annual meeting of the association, to be held at West Point, Miss., at an early date.

Reports of the executive committee show marked increase in the extensions and improvements being made by the Independent Telephone Companies in Mississippi. Among the improvements is a 10-wire cedar-pole, metallic-circuit-line under construction from Columbus, via West Point, to Aberdeen. The reports show that the Independent people have learned the importance of using nothing but the best material and good telephones, and that the public is demanding good service. It is hoped and expected that when the state convention of the association is held every Independent telephone man in the state will be present. The following members of the executive committee were present at the meeting: J. A. Richmond of the Citizens' Long-distance Telephone and Telegraph Company, Columbus, Miss.; A. W. Keasley of the Booneville Telephone Company, Booneville, Miss.; W. H. Harvey of the Oxford Telephone Company, Oxford, Miss.; L. B. Camp of the Amory and Tupelo Telephone Company, Amory, Miss., and C. W. Bolton of the Alabama, Mississippi and Tennessee Telephone Company, Pontotoc, Miss.

THE FRANCHISES OF TELEPHONE AND TELEGRAPH COMPANIES, LEGISLATIVE, MUNICIPAL AND CONGRESSIONAL.

G. C. HAMILTON, IN THE AMERICAN LAW REGISTER.

Primary among the questions confronting jurists and legislators of to-day is that concerning the granting of franchises to those creations of the law which owe there inception to the progress of modern scientific invention—telephone and telegraph companies. Although, in a measure, novel in their uses, but few new legal questions have arisen because of their existence, none to the adjudication of which well-settled legal principles have not been sufficient. Very little special legislation, on their behalf, has been enacted, or indeed required. That which has found its way into the statute book of the communities in which such electrical corporations exist has been enacted largely with a view to afford facilities for the better operation of scientific improvements, which are, in their very nature, of inestimable value to the general public. The residue of special enactments of this kind has been found necessary to restrain such corporations from exercising powers that are not essential to their existence and which have proved detrimental to already existing and well recognized rights.

The granting of franchises is a power that, unfortunately, has not always been exercised with proper caution, though a rigid conservatism in this respect, tending as it would to nullify and defeat the rapid strides of scientific invention and improvement, would undoubtedly prove deplorable, if not actually disastrous. A franchise being "a branch of the sovereign prerogative subsisting in the subject by a grant from the sovereign."[1] the delegation of such power should be primarily beneficial to the sovereign public, then, to the grantee. Shaw, C. J.,[2] well defines the extent of legislative power in this respect; he says: "In addition to the lawmaking power, the legislature is the representative of the whole people, with authority to control and regulate public property and public rights, to grant lands and franchises, to stipulate for, purchase and obtain all such property, privileges, easements and improvements as may be necessary or useful to the public, to bind the community by their contracts therefor, and generally to regulate all public rights and interests."

Of greatest moment, in regard to the franchises of telephone and telegraph companies, is their use of the streets, their existence upon the highways. Under the old English common law, the easement in a highway was the property of the king as universal trustee.[3] It consequently, under our form of government, becomes the property of the people, unless otherwise stipulated, may be disposed of by their representatives, and is subject to the absolute control of the legislature. The regulation of the streets is ordinarily given to a municipal corporation for corporate purposes only and is even then subject to the paramount control of the legislature as regards general and more extended uses.[4] The technical fee to the land may remain where it will, either in the adjacent owner or in the public, for as long as the land is preserved as a common highway, the rights of the technical owner are subrogated to the easement to such an extent as to practically cease to exist.[5] To divest itself of the control of the streets, and to vest a municipality with power to grant particular franchises, that in any manner affects the common easement enjoyed by the public, special action by the legislature is necessary and the municipality must be so empowered, expressly, or by direct implication.[6]

The legislative power to grant franchises is, in general, absolute, for, except when prohibited or restricted by the provisions of the state constitution, the legislature is fully empowered to grant all franchises, even if they be exclusive, within its own jurisdiction.[7] For a municipal corporation to grant exclusive franchises over the streets, it must possess the whole sovereign power and control of the highways, delegated to it by the legislature.[8]

It has been and is the practice of telephone and telegraph construction to follow, in so far as possible, the lines of streets and highways, as affording facilities otherwise not obtainable. It is not the purpose of this article to discuss the mooted question of compensation to the abutting owner, but rather the legal necessity of legislative sanction to enable these electrical companies to pursue this course. Jackson, J., says:[9] "It is well settled that the right to use the streets and other public thoroughfares of a city for the purpose of placing therein or thereon pipes, mains, wires and poles for the distribution of gas, water or electric lights, for public or private use, is not an ordinary business in which any one may engage, but is a franchise belonging to the government, the privilege of exercising which can only be granted by the state or by the municipal government of the city acting under legislative authority." This view has led to two very interesting lines of decisions. In the one, it is contended that the legislature stands simply as trustee for the easement of the public in the highway, and, as trustee, takes no greater title than is necessary to the proper execution of the trust. Hence it possesses no power to grant franchises to telegraph and telephone companies for the erection and maintenance of poles and wires upon the highways, and, though it is tacitly admitted that the granting of franchises to such companies is a proper exercise of legislative authority, the existence of such poles and wires upon the public streets is held to be contingent upon a grant from the abutting owner in whom the fee remains.[10] In the second line of decisions it is held that the construction of such lines, and their maintenance upon the streets, is a use similar to that for which the highways were acquired and constitutes no additional foreign burden upon the fee.[11] Hence the power to erect poles and string wires, provided the public easement in the highway is in no wise obstructed, is held to be a privilege conferred upon telephone and telegraph companies by and in the granting of a franchise to them.

As to the construction of franchises granted to telephone and telegraph companies, there can be no question. Every grant of a franchise, or in the nature of a franchise, is to be construed strictly.[12] Nelson, J., in the case of Minturn vs. Larne,[13] says: "It is a well-settled rule of construction of grants by the legislature to corporations, whether public or private, that only such powers and rights can be exercised under them as are clearly comprehended within the words of the act, or derived therefrom by necessary implication, regard being had to the objects of the grant. Any ambiguity or doubt arising out of the terms must be resolved in favor of the public." One granted, however, a franchise assumes the nature of a contract, and the state is bound by the grant of the rights, so conveyed by the legislature, even though they be exclusive, provided they are not in conflict with the constitution.[14]

Whether the grant of a franchise can be resumed by the legislature or its substantial advantages impaired, without the consent of the grantees, presents still another interesting question. Van Sycle, J.,[15] considers the power of the legislature, so to resume or impair a franchise, extremely doubtful, and says: "It is in the nature of a contract, and those who procured the passage of the act having entered upon the development of their scheme and made large outlays in its

1. 3 Bl. Com. 37; Finch, 164; 3 Cruise Dig. tit. 27, par. 1.
2. B. & L. R. R. vs. Salem & L. R. R., 2 Gray, 32.
3. 1 Rolle Abr. 392; Goodtitle vs. Alker, 1 Burr 143.
4. Phila. & Trenton R. R., 6 Whart. 25.
5. Sullivan vs. R. R. Co., 51 N. J. L. 518; Improvement Co. vs. Hoboken, 36 N. J. L., 540; R. R. Co. vs. Newark, 10 N. J. Eq. 352.
6. Phila. & Trenton R. R. vs. Hoboken, 35 N. J. L. 206.
7. Gibbons vs. Ogden, 9 Wheat. 1; West River Bridge vs. Dix et al., 6 How. 507; Shorter vs. Smith, 9 Ga. 529; New Hampshire Bridge et al., 7 N. H. 35; Cal. Teleg. Co. vs. Atl. Teleg. Co., 22 Cal. 398; Hazen vs. Union Bank, 1 Sneed (Tenn.), 115.
8. Waterworks vs. Atl. City, 39 N. J. Eq. 367; Grd. Rapids. E. L. & P. Co. vs. Grd. Rpds. Edison E. L. & F. G. Co., 33 Fed. Rep. 659.
9. Grd. Rpds., etc., Co. vs. Grd. Rpds. Ed., etc., Co., 23 Fed. Rep. 659.
10. Mut. Tel. & Tel. Co. vs. Colwell Lead Co., 67 How. Pr. 365; B. of T. Tel. Co. vs. Barnett, 107 Ill. 507; W. U. Tel. Co. vs. Williams, 86 Va. 696.
11. Pierce vs. Drew, 136 Mass. 75; Boston vs. Richardson, 13 Allen, 146; Atty. Gen. vs. Met. R. R., 125 Mass. 515.
12. U. S. vs. Arredondo, 6 Pet. 738; Beaty vs. Knowler, 4 Pet. 168; Providence Bank vs. Billings, 4 Pet. 514; Charles River Bridge vs. Warren Bridge, 11 Pet. 420.
13. 23 How. 436.
14. Charles River Bridge vs. Warren Bridge, 7 Pick. 344.
15. State vs. Blake et al., 35 N. J. L. 208.

promotion, have acquired rights which must be regarded." A view that, because of a proper and fitting regard for vested rights, has been very generally taken." So it has been held that a subsequent statute interfering with, restricting, or tending to nullify a previously granted franchise, or the rights thereunder acquired, is, in so far as it so interferes, inoperative and void." And while the legislature is empowered to exercise the police power of a state, subject to the power of the court to adjudicate the question as to whether any particular enactment is an invasion of the constitutional rights of the individual, it may not, under the guise of protecting public interests, interfere with or restrict private business."

The primary question, in the granting of franchises to telephone and telegraph companies by a municipality, is that concerning the authority of the particular municipal corporation in question to make such grants. The question at issue is necessarily: Has the legislature expressly or by necessary implication, in the granting of the municipal charter, or by subsequent legislative enactment applicable to such municipality, delegated to it such portion of the legislative authority as is necessary to the lawful exercise of such power?" If general control over the streets has been so granted, the municipality may clearly grant franchises for the use of the streets, provided no additional burden is imposed upon the fee." As to the necessary method of action Van Vleet, V. C., says:" "Where no method is prescribed in which a municipality shall exercise its power, but it is left free to determine the manner for itself, it may act either by resolution or by ordinance. One method is just as effectual in point of law as another."" In pursuance of such delegated authority, a municipality may grant a franchise that shall be in its nature exclusive, conveying thereunder rights that the city may not subsequently impair nor restrict." Nevertheless, the franchise so granted acquires simply the nature of a contract, and if the telephone or telegraph company erects its poles and wires under authority of an ordinance, which provides for the expiration of its privileges on and after a certain date, such company is possessed of no legal right to maintain such equipment, within the corporate limits, after the life of such grant." So the passage of an ordinance by a municipality, permitting the erection of poles and wires by a telegraph company on conditions of benefit to the city, the acceptance of the ordinance by such company and the subsequent enjoyment of the benefits by the municipality, constitute all the necessary essentials of an executed contract which the city may not violate."

Telephone and telegraph companies are, however, properly subject to municipal regulation, irrespective of the authority granting the franchises under which they operate. The imposition of suitable conditions, regulations and restrictions, in the form of municipal ordinances, is to be supported as a proper exercise of the police power of a city, provided they do not evidence a desire to oppress, or unwarrantably control the maintenance and operation of telephone and telegraph lines within the city." So an ordinance requiring such electrical companies to place their wires in conduits is a proper exercise of municipal police power;" likewise a charge, in the nature of a rental, for the exclusive use of parts of the streets;" and a city may lawfully impose a tax upon the poles and wires of telephone, or telegraph companies, maintained within the corporate limits, to cover the expense to which the municipality is subjected, in the enforcement of its police regulations, because of the maintenance of such equipment upon the streets of the city;" but such tax must be fair and reasonable, and a municipality, in the exercise of its police power, may not impose exorbitant charges, nor seek to derive from such taxation revenue vastly disproportionate to the actual outlay for supervising and inspecting such poles and wires." Indeed, the whole question of the proper municipal regulation of these and kindred electrical companies is one of the greatest nicety. On the one hand, we have arrayed the inviolability of existing rights, possessing all the attributes of the consideration of an executed contract, together with the natural desire to promote and facilitate the operations of creatures that so largely tend to improve and widen the scope of business enterprise and social comfort; on the other hand, the necessity for a fitting regard for the safety of the community and for the proper preservation of the rights of its individual members.

The powers of Congress as to the franchises of telephone and telegraph companies are those conveyed by the federal constitution. Article 1, section 8 of the constitution, which confers upon Congress the power to regulate interstate commerce, permits the states to regulate matters of local interest, which affect, only incidentally, commerce between the states, but the authority of Congress is universal and exclusive where the matter is characteristically national. If Congress fails to act and provides no law for the regulation of commerce between the states, of that nature which makes congressional jurisdiction exclusive, it thereby indicates its desire that such commerce shall not be the subject of state regulation." So a state will not be permitted to restrict, or impose burdens upon the transmission of messages by telephone or telegraph companies, from one state to another." Nevertheless, such companies owe obedience to the laws of the state within which they are located and are under obligations to pay their fair share of the taxes necessary for its support," when levied upon their real or personal property within the jurisdiction of the state." Telegraphic and telephonic communication between the states is part of their commercial intercourse and so properly subject to the control of Congress," and state franchises granted to such companies as operate interstate lines are subject to congressional control, in so far as it may be necessary to control them for the regulation of commerce."

Acting upon these premises, Congress, July 24, 1866, passed what is known commonly as the "Telegraph Act." It may be stated, at the outset, that there can be no doubt that telephone, as well as telegraph, companies are included within the provisions of this legislation." The first paragraph of the act, which alone is of importance in this discussion, provides that telegraph companies, organized under the laws of any state, may construct, maintain and operate their lines over any part of the public domain, military or post roads, and under or across any navigable streams of the United States, provided they do not interfere with ordinary travel, or in any way obstruct the same." The court, in the case of the Pensacola Telegraph Company vs. the Western Union Telegraph Company," defining the powers acquired under the act, says: "It gives no foreign corporation the right to enter upon private property, without the consent of the owner, and erect the necessary structures for its business; but it does provide that whenever the consent of the

16. Planters' Bank vs. Sharp., 6 How. 301; People vs. Manhattan Co., 9 Wend. 351; Bridge Co. vs. Hoboken Co. 2 Beas. 81.
17. Dartmouth College vs. Woodward, 4 Wheat. 518; State Bank of Ohio vs. Knoop, 16 How. 369; Farrington vs. Tenn., 95 U. S. 679; Fletcher vs. Peck., 6 Cranch. 135; Dodge vs. Woolsey, 18 How. 331.
18. Lawton vs. Steele, 152 U. S. 137; Mugler vs. Kansas, 123 U. S. 623.
19. 2 Dillon Mun. Corp., par. 680.
20. Pelton vs. E. Clev. Ry. Co., 22 Week. L. Bul. 67.
21. Halsey vs. R. T. St. Ry. Co., 20 Atl. Rep., 859.
22. State vs. Jersey City, 27 N. J. L. 493; Burlington vs. Dennison, 42 N. J. L. 165; Butler vs. Passaic, 44, N. J. L. 171.
23. Teachout vs. Des Moines B. G. R. R. Co., 75 Iowa, 722.
24. Mut. Un. Tel. vs. Chicago, 16 Fed. Rep. 309; So. Bel. Telep. Co. vs. Richmond, 98 Fed. Rep. 671.
25. St. Louis vs. W. U. Tel. Co., 63 Fed. Rep. 63; New Orleans vs. So. T. & T. Co., 40 La. Ann. 41; Chicago vs. Sheldon, 9 Wall. 50; Kentucky vs. Corrigan, 86 Mo. 67.
26. Richmond vs. So. Bell Telep. Co., 174 U. S. 761.
27. W. U. Tel. Co. vs. Mayor, 28 Fed. Rep. 552.
28. St. Louis vs. W. U. Tel. Co., 149 U. S. 465.
29. Phila. vs. W. U. Tel. Co., 32 C. C. A. (Pa.) 246.
30. Phila. vs. W. U. Tel. Co., 81 Fed. Rep. 948
31. Brown vs. Houston, 114 U. S. 622; Gloucester Ferry Co. vs. Pa., 114 U. S. 196; Walling vs. Mich., 116 U. S. 446; Pickard vs. Pullman So. Car Co., 117 U. S. 34.
32. Ry. Co. vs. Ill., 118 U. S. 557.
33. Teleg. Co. vs. Mass., 125 Mass. 548.
34. W. U. Tel. Co. vs. Ala., 132 U. S. 472; W. U. Tel. Co. vs. Charleston, 163 U. S. 711.
35. W. U. Tel. Co. vs. Atl., etc., Co., 5 Nev. 103.
36. Gibbons vs. Ogden, 9 Wheat. 206.
37. Cumb. T. & T. Co. vs. Un. El. Ry., 42 Fed. Rep. 273; Wis. Tel. Co. vs. Oshkosh, 62 Wis. 32; C. & P. Tel. Co. vs. B. & O. Tel. Co., 62 Ind. 410.
38. Rev. Stats. U. S., par. 5263.
39. 96 U. S. 1.

owner is obtained, no state legislation shall prevent the occupation of the post roads for telegraph purposes by such corporations as are willing to avail themselves of its privileges." So a telegraph company may not, relying upon this act, occupy the streets of a city without compensation[40] and, although all railroads are post roads,[41] a telegraph company is given no right to occupy the right of way of a railroad with its lines without the consent of the railroad company.[42] On the other hand, the railroad company may not make an exclusive contract of this nature[43] and a telegraph company may acquire right of way over a railroad, without the consent of the latter, by due process of law.[44]

The question of state taxation of companies accepting the benefits of the act of 1866 has given rise to a multitude of decisions. There can be no doubt as to the right of the state to impose taxes upon business carried on wholly within its jurisdiction,[45] but a specific tax upon each message transmitted beyond the state is unconstitutional,[46] and a tax upon the franchise of such a company is void;[47] nor may a state impose a tax upon messages partly within the state.[48] Strong, J., in the case of the Railroad vs. Penniston,[49] discussing the question of state taxation of federal agencies, says: "It is, therefore, manifest that the exemption of federal agencies of taxation is dependent, not upon the nature of the agent, or upon the mode of their constitution, or upon the fact that they are agents, but upon the effect of the tax; that is, upon the question whether the tax does in truth deprive them of power to serve the government as they were intended to serve it, or does it hinder the efficient exercise of their power." An opinion that states clearly and briefly the true rule by which state taxation of companies operating under the "Telegraph Act" must be measured.

Telegraph companies enjoying the privileges of the act of July 24, 1866, do so in subordination to the due exercise of the police power of the state in which their lines are situated;[50] the rights so given are permissive only and properly subject to all state and local legislation regulating their exercise. So a municipality, under the exercise of its police power, may enact and enforce ordinances intended to promote the safety and convenience of the public in its use of the streets;[51] but where such regulations and restrictions are excessive, or evidence a desire to oppress, control or defeat the company's existence, they are void.[52] It is not the intention of the act of July 24, 1866, to do more than exercise a proper control of a business, whose very nature makes its operations interstate commerce, but neither state nor municipality may enact laws that hinder the exercise of the powers, the enjoyment of the privileges Congress has so conferred upon electrical companies of this nature. Nevertheless, a proper interpretation of the law demands that telephone and telegraph companies operating under the act be subject to legislation that is simply the due exercise of the police powers of the state or municipality.

TELEPHONY, Chicago, Ill.

Gentlemen:—I notice your article in July number of TELEPHONY, "What Shall the Word Be?" asking what shall we call a message sent by telephone.

I beg leave to suggest the word "phonogram" as a suitable word, which possesses sense and euphony.

Yours very truly,

JOHN A. DIFFEY,
Cotton Plant, Ark.

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40. St. Louis vs. W. U. Tel. Co., 148 U. S. 92.
41. Rev. Stats. U. S., Sec. 3964.
42. W. U. Tel. Co. vs. Ann Arbor R. R. Co., 90 Fed. Rep. 379.
43. W. U. Tel. Co. vs. B. & O. Tel. Co., 19 Fed. Rep. 660; Postal Teleg. Co. vs. W. U. Teleg. Co., 50 Fed Rep. 493.
44. Mercantile Trust Co. vs. A. & P. Ry. Co., 63 Fed Rep. 513; Postal Tel. Co. vs. Southern Ry. Co., 89 Fed. Rep. 190; Postal Tel. Co. vs. Clev. Ry. Co., 94 Fed. Rep. 224.
45. Ruttermann vs. W. U. Tel. Co., 127 U. S. 411.
46. Teleg. Co. vs. Tex., 105 U. S. 460.
47. San Francisco vs. W. U. Tel. Co., 31 Pac. Rep. 10.
48. In re Penn. Tel. Co. (N. J.), 20 Atl. Rep. 846.
49. 58 Wall. 5.
50. Richmond vs. Bell Tel. & Tel. Co., 174 U. S. 761.
51. Mich. Tel. Co. vs. Charlotte, 93 Fed Rep. 11.
52. Richmond vs. So. Bell Tel. & Tel. Co., 174 U. S. 761.

TELEPHONY FROM A SCIENTIFIC STANDPOINT.

BY HARRY S. COYLE.

A learned judge once said "that no man knows how the telephone works." It is not the invention of one man, but of many men, of many lands, who experimented and worked in the past ages, as in the present time. He was undoubtedly correct, for the electrical sciences are in such a state of unrest that it is not to be wondered at that man will not stop in his irresistible march toward electrical domination to study some old appliance that has seen its best day.

The perfection of the telephone as a practical working instrument for the industrial systems of the earth is such that it is safe to predict that further extensibility along the lines that have been pursued in the past is well-nigh impossible. There may be many alterations, many improvements in the methods of performing its functions; we may have wireless telephony, and we may have things that we never allowed ourselves to dream of, but the telephone as we know it has reached its acme as a commercial utility.

I do not mean to say that the science of telephony is bankrupt; it is as yet in a deceptive twilight of science, no more so than any other branch of electrical knowledge. But the light is so dim that it will not enable us to explain many of the great questions of the science of telephony. We know little or nothing about the primitive patents of the telephone, very little is known about the electrical transmission of sound; we are ignorant of the true nature of electricity, and until science enlightens us, telephony must remain in the twilight.

In modern life commerce demands and science produces. Especially is this so of the electrical sciences. Let commerce define her wants and the electrician, like the slave of Aladdin's wonderful lamp, will say, lo, here it is! He is the realization of the myth of Orpheus—at his touch the speech of man goes tumbling over the earth; he harnesses the lightning to his chariot; the thunderbolt is his messenger; the forces that dwell in space come down and sing a song of love to him. The force that was hitherto regarded as destructive and evil, becomes a remedy in disease and as an aid to diagnosis it has reached its perfection. I fear that I would weary you if I would tell all that these great inventors and artisans have done for mankind, for not half has been told.

The beneficial work of the electrician is in favor of the business community, which troubles itself little about questions relative to cause and effect. It studies only how the best can be invented and how it can be cheaply made. There has been no actual demand that science should solve the unanswered questions of telephony, for it does not seem that it is necessary for the advancement of the science at this stage. The progress of the electrical sciences has been so rapid that we could not turn aside to study the "why and the therefore" of electricity. It was a result of competition, for men are working with feverish anxiety to produce the best, the most wonderful and useful invention which will thrust a revolutionary force into the social and industrial systems of the earth.

To the human individual, who seldom lives beyond three score and ten years, and whose short life is crowded with the business affairs of life, time is considered a precious commodity, to be spent with economy, its loss and its waste lamented, and its use converted into a religious duty.

We have been speaking of telephony as a science; when we consider its theoretical problems it is in a scientific sense. When we apply these theories to practice it becomes an art. Telephony is an art—the art of oral communication at a distance. Telephony is also a science in all that the term implies, but when a science produces such a profound influence on the race and comes into such universal use as the telephone it becomes an art. In general, a science is systematized knowledge; art is the application of this knowledge to practical purposes, which is made efficient by skill.

The poverty of telephony as an exact science is apparent to all, while its development as an art has been tremendous, especially during the past eight years. We can build a telephone system that science has suggested; it will answer all practical purposes, it has surpassed our fondest dreams, and yet we are ignorant of many of the essential principles of the science. A great inventor truly said, "The regions of the electrical sciences are as yet unexplored."

Experimentation and observation are the two eyes with which man looks into the mysteries of nature, the two lenses which he uses in investigating and verifying his theories, examining whatever has attracted his attention, or stimulated his thirst for knowledge. When his theory can be supported by experiment and thus verified, it becomes a law or a principle. When he classifies these facts which he has discovered they constitute scientific knowledge. When he applies this knowledge to practical purposes the science is then practiced as an art. Man has been an imitator of nature at all times; from her he has received his ideas and inspirations by addressing her in the only language that she can understand, "the experiment," that silent and mysterious process which has and is accomplishing so many wonderful and beneficial things. We are the children and heirs of nature; in the experiment she is advising us how to secure happiness and how to enrichen our inheritance. Progress in the arts and sciences has been accomplished by the union of two great forces. Science gave its hand to mechanics. Science thought and experimented, while mechanics worked; science drew the blue print, the artisan, by a careful course of study and with deft hands and nimble fingers, gave material existence to the theoretical problems of the scientist. By the bending of theory and practice, by the union of great thinkers and experimenters with the skilful artisans, we have as the sum total the modern art of telephony, and, of course, this is true of all other branches of knowledge or industry.

It is not likely that the first experimenter who obtained an electric spark sufficiently strong to produce a sensible sound should at once have been struck by the fact that he was in the presence of thunder and lightning on a small scale. Speaking of experimenters recalls to our memory some of the incidents that attended the laying of the Atlantic cable. What benefit their experience will prove to modern experimenters who are trying to solve the problems of trans-oceanic telephony remains to be seen. The experimenters started out with a very large number of batteries, as no response could be obtained from the other side of the sea, more battery was employed, and still more battery. Some of the discouraged experimenters said that it would take a square mile of batteries to send a message three thousand miles. Some genius, who is, of course, unknown, suggested "less battery." Happy thought. Here lies the solution. With two cells a message was conveyed and then the scientists awoke to the fact that they were dealing with an appliance that is entirely foreign to the land telegraph.

As a general rule, the modern telephonist is not an experimenter; he is an artisan, and as such he is master of his calling. At his touch the formulæ and lines of the experimenter becomes a reality; he can clear any case of trouble that presents itself to him. The improvements on the modern switchboards are such that cases of outside trouble can be seen at a glance. Of course, this is not true of all classes of trouble. For example, the dip of line between the poles becomes so slack that at every breath of wind it oscillates and crosses another wire, which produces a flickering light of the lamp signals on the board. One can almost imagine that he can see the troubled line while watching the lamp on the switchboard. The trouble clerk can dispatch a man out to clear the case even before the subscriber knows that his line is in trouble. Well, indeed, has Sir William Thomson called the telephone "the wonder of wonders," even in the wonderland of electricity.

The telephone is one of the highest productions of the electrical science. It is here that theory is put into practice, it is here that electro-physics has received its great impetus. And it would be a long but a beautiful story to tell how men studied and advanced their own arts and sciences in order to lift telephony up to its elevated throne.

If we would analyze the telephone industry we would find that it rests upon the foundations of many arts and sciences, all trying to produce the best material, the best tool that would enable the manufacturer of telephone apparatus to produce the best instrument. And when we see conscientious men and women in every nook and corner of the earth working toward one common destiny we may rest assured that progress is certain, and we cease to marvel at the wonders that they have bestowed upon the world. With the advent of the telephone upon the earth it has produced a condition of affairs which makes the world almost mimic a thoughtful being. It seems that the wires which ramify in all directions are its nerves. Touch one part of the earth and the whole of it responds. The day is not far distant when we can telephone to Paris, or St. Petersburg, or Manila, or anywhere on the face of the earth. The telephone will be a powerful factor in preparing and hastening the true brotherhood of mankind. This picture transports us into the future; we have already seen enough to authorize us to cherish the fairest hopes and to expect with confidence their realization.

When science has formulated the problems of trans-oceanic telephony and when these formulæ are made practical by art, then the king of England can speak direct with the president of the United States, the student can hear French as it is spoken in Paris, the girl can speak with her sweetheart on the distant fields of battle, the mother can hear the voice of her beloved soldier boy, who is beyond the sea, and know that he is in the land of the living. And, oh, what happiness and joy, and comfort has the telephone brought to us mortals!

A NEW PAY STATION DEVICE.

The Kellogg Switchboard and Supply Company has recently placed on the market a new pay station device which is meeting with considerable success. The company reports that this device is being adopted by some of the leading

Independent telephone exchanges. Bulletin No. 3, which will be sent upon request, illustrates and describes this device. It is adapted for use in connection with any style of telephone and is entirely mechanical. Over 2,000 of these pay stations are now in use.

"You have a first-class paper—one that is instructive and interesting and worth four times the money.

L. O. WILLIAMS, Mgr.,
National Telephone Co.,
Coffeyville, Kan."

Telephony.

AN ILLUSTRATED MONTHLY TELEPHONE JOURNAL

PUBLISHED BY

The Chambers-McMeal Company.

MANHATTAN BUILDING, CHICAGO, ILL.

Telephone Harrison 2951.

EASTERN OFFICE: - - 257 West 36th Street, NEW YORK.

Subscription in the United States, Canada and Mexico $1.00 Per Year.

Foreign Countries, $2.00.

Entered at the Chicago Post Office as Second Class Mail Matter.

CHICAGO, SEPTEMBER, 1901.

Table of Contents.

The Story of Ohio, Hon. H. D. Critchfield.....101-108
Well-Known Heads of Well-Known Houses..... 109
New Independent Exchange for Toledo..... 110
Williams-Abbott Electric Company.....110-112
American Toll Telephone Company, Factory.....112-113
Williams Electric Company, Cleveland..... 113
Independent Telephone Association of Mississippi..... 113
Franchise of Telephone and Telegraph Cos., G. C. Hamilton, 114-116
Telephony from a Scientific Standpoint, Harry S. Coyle....116-117
A New Pay S ation Device..... 117
EDITORIAL.
The Story of Ohio..... 118
An Independent Exchange for Chicago..... 118
Glasgow's Municipal Telephone System..... 118
President McKinley..... 119
What Shall the Word Be?..... 119
Telephone, Telegraph and Cable Co..... 119
Digest of Telephone Patents, Edward E. Clement.....120-123
Decisions Affecting Telephony.....123-124
Municipal Telephones in Foreign Cities..... 124
British Telephone News..... 125
How Jack Proposed, Frank Goewey Jones..... ...126-127
Letters to Telephony..... 127
Trade Notes 128-129
Protection 129
The Standard of Madison..... 129
Warner Ringing Apparatus..... 130
Sterling Electric Company..... 131
Paranite Wire and Cables 131
Kentucky Telephone A sociation 131
"Our Friends, the Enemy," George P. Haywood.....132-133
Southern Illinois Telephone Meeting..... 133
A Phenomenal Growth 133
Telephone Auxiliaries, J. E. Keelyn..... 134
American Prosperity..... 134

THE STORY OF OHIO.

In this issue of TELEPHONY we present the telephone story of Ohio, which, we believe, will be found of general interest. The story is from the pen of Hon. H. D. Critchfield, than whom no man is better known in the Independent field or is in better position to tell of the progress and development of the art in the Buckeye state. These stories of the states are meeting with marked favor and give a fair idea of the status of the movement. In October we will tell the story of Missouri, and in the November TELEPHONY we will publish the story of Illinois, the banner Independent telephone state.

AN INDEPENDENT EXCHANGE FOR CHICAGO.

All arrangements for the entrance of the Illinois Telephone and Telegraph Company, a corporation independent of the Chicago Telephone Company, into the Chicago field have been made. The company has filed a trust deed under a mortgage to secure a bond issue of $5,000,000. Much of the money to be derived from the issue will be used to establish a big plant in Chicago. It is understood that already $3,000,000 of the bonds have been sold, through J. B. Russell & Co. of Wilkesbarre, Pa. The other $2,000,000 will be held in the treasury for future development of the system. The entire capital stock—$5,000,000—will be deposited under a voting trust agreement for a period of two years. A. G. Wheeler, president of the company, said upon the subject: "The work of installing the plant will be pushed vigorously from this time, in order that we may establish our telephone service at the earliest possible date. We are endeavoring to complete the plant so as to have 15,000 telephones in the downtown district by next spring." The Illinois Telegraph and Telephone Company was organized to compete with the Chicago Telephone Company. The new company will introduce what it claims is a more up-to-date instrument, a better service and a lower rate than that granted by the Chicago Company.

GLASGOW'S MUNICIPAL TELEPHONE SYSTEM.

The ceremony at which the new municipal telephone system of Glasgow was formally opened about two weeks ago was a notable event even for the city which has become famous through successful kindred adventures. It was notable scarcely more because it celebrated the second instance of a municipal telephone system in the United Kingdom and the first in a large city of that kingdom than because it marked the successful issue of an effort which, with characteristic Scotch persistence, has been pursued in face of obstructions and delays for more than eight years.

It was in April, 1893, that the town council appointed a special committee to inquire into the advisability of establishing a municipal telephone system, and in the following August that body decided to apply to the Postmaster General for the requisite license. The reasons for this decision were principally the commercial need for a better telephone service than that which then existed and at less cost and the desirability of retaining in the city's hands the constructional work in the streets which would be necessary for installing a proper system.

The Postmaster General delayed action for two years, and a select committee of the House of Commons was in the meantime appointed to inquire as to the expediency of municipal undertakings of this sort. In 1897 the Postmaster General appointed a special commission on the Glasgow case, and, although this commission reported in favor of the city, the license was still withheld. In 1898, however, another special committee of the House of Commons was created, which recommended either municipal undertakings or the inauguration of local exchanges by the postoffice department, and Parliament having passed a general act on the subject in 1899, the license was finally issued to Glasgow on the 1st of March, 1900.

It authorized a system covering the city and its surroundings—an area of 143 square miles—and providing for 10,500 subscribers. Construction work began in July of last year, and a limited number of users were connected last March. The number now exceeds 1,400 and there are at present 5,382 subscriptions. Except in outlying districts the system is underground, shifting wire connections making it practical for a subscriber to retain the same number under all circumstances, while another interesting feature of the service is the large, airy and comfortable recreation room provided for the operators near the central switch-room.

This latest enterprise of the Scottish commercial capital will inevitably emphasize the rapidly growing movement among British towns for municipal telephones.

PRESIDENT McKINLEY.

The tragic death of President McKinley has cast deep gloom over the people of the United States in particular and the whole world in general. Especially are those connected with Independent telephony grieved at his loss, for it was during his administration that the people were freed from the tyranny and oppression of a telephone monopoly. This was largely accomplished through the efforts of men who were in close touch with our mourned and martyred president.

William McKinley.

McKinley was pre-eminently a Man; as a citizen, soldier, statesman and executive he touched a combination of chords musical to the hearts of his countrymen. Wisely conservative, sincere of purpose, fearless yet tender of action, broad and liberal in his ideas, modest in all things, he has left in each American heart a pulsating picture of love and respect. To-day he occupies the greatest place in our affections. His dying hours at the Milburn home are a collegiate course in Americanism, exemplifying the noblest type of manhood.

Let that peace and security which so marked his desires attend our ways and beget to his successor, President Theodore Roosevelt, our full confidence and loyalty.

WHAT SHALL THE WORD BE?

The question has been asked, "What shall we call a message sent by telephone?" A message sent by telegraph is termed a telegram, but a message sent by telephone is as yet without a name. "Telephrone" has been suggested, as well as "Telepheme" and "Telephem," neither of which seems to be the proper word. For the word "Phonegram" we are indebted to Dr. B. Frank Hockman of Sumner, Illinois. This strikes us as being the most euphonius and sensible word yet suggested. The doctor suggests that TELEPHONY is the medium in which to settle this question. We shall be glad to have the opinion of telephone men as to the best word for common use. A word combining sense and euphony will be adopted. To every reader of TELEPHONY we ask the question, What shall we call a message sent by telephone?

TELEPHONE, TELEGRAPH AND CABLE CO.

The City Trust Company of New York, the depository for the stock of the Telephone, Telegraph and Cable Company of America, announced that over two-thirds of the stock had been deposited in accordance with the recent offer of Charles W. Morse to the stockholders, and that the offer has become operative. The offer of Mr. Morse, who was at the head of the American Ice Company, to the Telephone, Telegraph and Cable shareholders was to pay 50 per cent of the amount paid in, provided that at least two-thirds of the stock should be deposited with the City Trust Company on or before September 10.

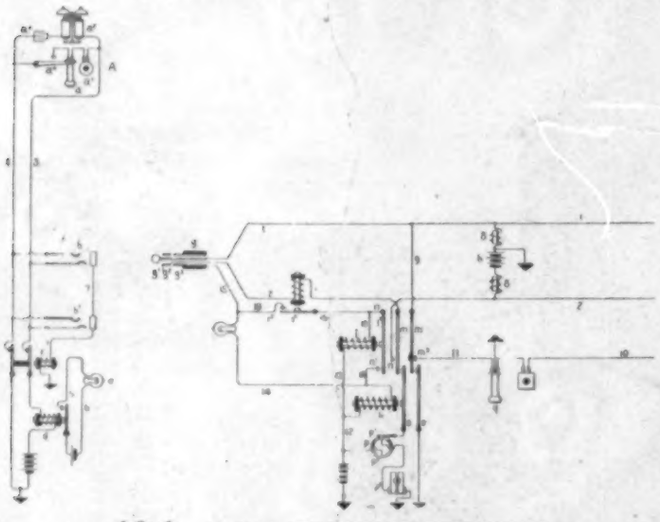
DIGEST OF TELEPHONE AND KINDRED PATENTS.

CONDUCTED BY EDWARD E. CLEMENT.

678,369.—F. R. McBerty. Calling Appliance for Telephone Switchboards.

This is an arrangement of circuits such that the act of plugging in to call a subscriber will automatically bring the calling generator into connection with the line, and disconnect the operator's set which is normally connected to the cord; and when the subscriber answers by taking his telephone from the hook the calling generator will be automatically removed from the cord circuit and a clean through circuit be established. A special form of relay, having two magnets, is employed in this device. The circuits are as follows:

3-4 is a subscriber's line, having the ringer at the subscriber's station normally connected in series with a condenser, and the telephone set cut in only when the hook is up. At the central station a line relay d controls a lamp e, and a cut-off relay f acts when energized to cut the line off from the main battery c and the line relay. This is all arranged as well understood in connection with the familiar "relay" type of switchboards of the American Telephone & Telegraph Company (Bell). The invention lies entirely in the

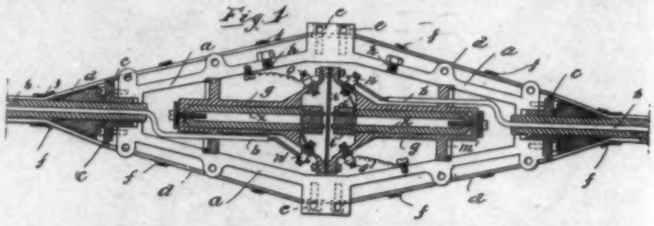


678,369—CALLING APPLIANCE FOR SWITCHBOARD.

cord circuit apparatus. Heretofore there have been devices for connecting the calling generator to a called line, and disconnecting them when the called subscriber answered, but they have all involved mechanical construction of a kind that was not strictly reliable under all conditions, such as interlocking switch mechanism. In the present case the operation is dependent entirely on circuit changes, leaving the mechanical elements simple relays. The cord circuit is shown in the figure as the end of an incoming trunk, but this is merely a matter of convenient illustration. The operator at q is supposed to have received an order for connection over the order circuit 10. She touches the tip of the plug g to the jack sleeve for test, and, finding the line idle, inserts the plug. Current immediately flows from the battery r through the magnet k and by wire 14 and lamp j to the jack sleeve, and so to cut-off relay f and to ground and back to battery. Magnet k, being energized, pulls springs o and o′ against contacts on springs m and m″ whereupon current flows from the spring o out to line and back to spring o′ and to ground. This current is alternately ringing current from the generator p^2, and battery current from the battery r, the change being affected by a constantly revolving commutator p. It should be noted that the lamp j does not light at this time, nor does the relay i in the cord become excited, as the ringing current from generator p^2 is insufficient to affect it while the ringer and condenser at the subscriber's station are in circuit, and the battery current cannot flow. As soon as the subscriber answers, however, the battery current finds a path through relay i, and the armature i′ is attracted, with the result that the circuit of the magnet 1′ is closed, and springs 1^3 and m are held over. A path is now closed for current from battery r through magnet 1, by 17, 1^2, n′, 18, to lamp j and by jack sleeve to ground. The cord circuit is closed at n, and the generator is removed from the line. Current from main talking battery h also flows to line through relay i, as long as the receiver is off the hook, and the relay keeps the lamp shunted. When the lamp j finally lights to disconnect the withdrawal of the plug from the jack permits all the parts to resume their normal positions.

678,509.—J. Nessel and J. F. Gouin. Long-distance Relay Magnetic Telephone.

This is a very simple relay in principle, consisting merely of two receivers acting from opposite sides on the same diaphragm. The figure shows the apparatus contained in a metal casing d, meant to be inserted in a submarine cable. The armor wires of the cable are spread and

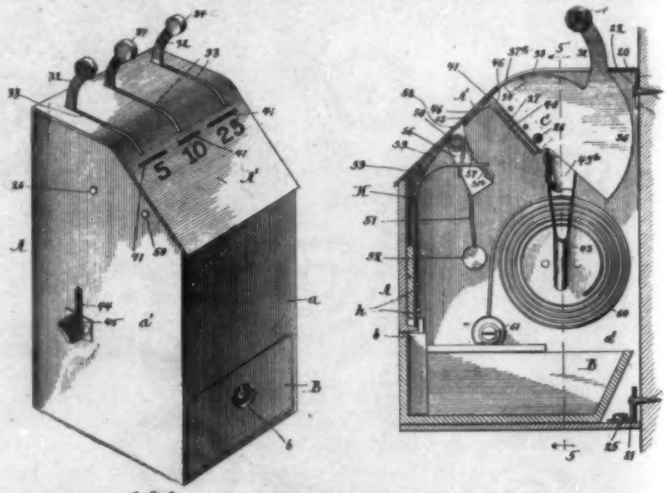


678,509—LONG-DISTANCE RELAY MAGNETO TELEPHONE.

carried along the outside of the casing at d, being tied in by wrapping at f and secured by screws at e. One line comes in at the left in the figure, being marked b, and the other at the right, marked also b. Each is connected to the windings of one receiver. When the left-hand receiver acts on the diaphragm k the latter vibrates before the poles of the right-hand receiver and sends correspondingly generated currents to go to line on the right, while if the right-hand receiver acts on the diaphragm, the left-hand one becomes the generator.

678,632.—E. P. Baird. Toll Apparatus for Telephones.

This is a toll box for application to telephone instruments, whereby the operator at central is audibly apprised when the required toll or token has been deposited. A metal



678,632—TOLL APPARATUS FOR TELEPHONES.

box A is provided, with a removable locked coin box B, and a top A′. In the latter are three or more openings for the reception of coins of different denominations. At one side of the box is an opening 44, with a cup 45, whereby coins that are not suitable are returned to the user.

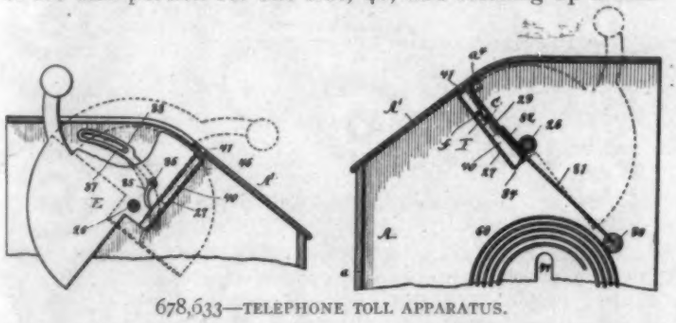
The right-hand figure shows a portion of the apparatus within the box. Behind each coin slot is a pivoted lever 32, carried on a disk 36 pivoted at 26, to be turned at will.

The edges of the disk 36 are made on such radial distances from the center 26 that they keep the slot in which the lever and disk work, closed, in every position of the latter. On the front edge of the disk the chute or coin guide 27 is carried, normally registering with the slot in the cover of the box, the lever being held in the position shown by a suitable coiled spring. When a coin is deposited, if of the proper size, it is caught in the carrier or chute 40, and held by a stop, not shown. When the handle of the lever 32 is pulled the latter and the disk revolve about the shaft 26 and the coin is brought against the dog 57, pivoted at 50, and carrying a hammer 52 in proximity to the gong 60. The coin carrier itself is slotted at 46, so that with no coin in it the dog 57 cannot be reached or moved. As the coin passes over the face of the dog, it is kept from being retracted to repeat signals, by teeth formed in the face of the dog. As the coin passes off the lower end of the face of the dog, by continued motion of the lever, the dog is retracted by its spring 59 and the hammer 52 is thrown against the gong 60, to sound the latter, the sound being carried through the walls of the box and the adjacent solid support to affect the transmitter. The coin drops into the box B at the end of its travel, and the lever can be retracted.

In order to give distinctive signals for different coins or tokens, signal devices of different tones and characters are provided. The gong 60 is replaced by a bell in one instance, and in another the dog 57 is done away with entirely and the coin in its travel passes over the end of a spring which is fastened to the side of the box, so that when it slips off the end of the spring the latter vibrates and makes a sound like the familiar "buzzer."

678,633.—E. P. Baird. Telephone Toll Apparatus.

This is a toll box similar to that just described, these being, in fact, companion cases. The principal points in the present case are, first, a coin carrier or chute formed up in the edge of the pivoted pull lever E, by bending the metal of the disk portion for one side, 40, and forming up a com-



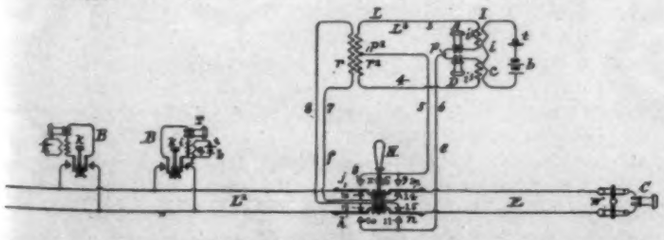
678,633—TELEPHONE TOLL APPARATUS.

panion piece of a separate piece of metal; second, a positive ejector for the coin, that will push the coin out of the carrier at the end of the latter's travel, and, lastly, a damper for the gong or sounding device.

The formed-up chute is shown at 40 and needs no description. It has a stop for the coin formed by making an indentation in the side of the tube. The ejector is shown at 85, being a finger pivoted at 86 on the disk E, and moved by a pin 88 in a can slot.

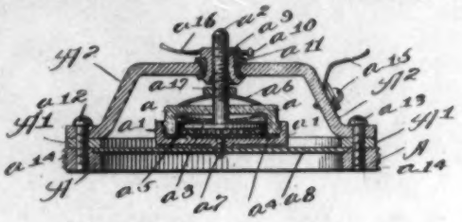
The damper is shown at 80 in the second figure. It is raised off the gong when the coin carrier descends.

11,922.—P. G. Burgess and H. W. Wilder. Telephone Circuits.



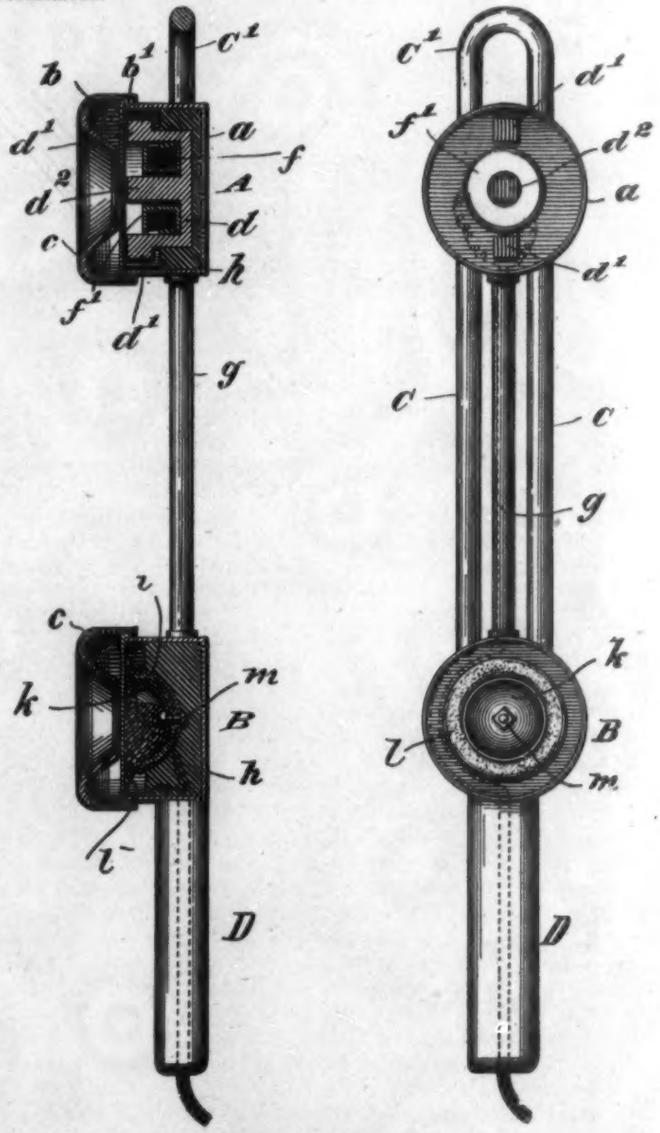
11,922—TELEPHONE CIRCUITS.

This is a scheme for operators' talking circuits, such that orders coming over an instruction circuit may be received, but not answered, while conversation is had over other circuits, which, however, do not get the order circuit talk. In the drawing L^3 is an order circuit extending from operators at B B to operator at A, while E is a subscribers' line. A neutral wire 5-6 is run through the key H, joining the middle of a repeating coil rr^3, to the middle of secondary



678,972—TELEPHONE TRANSMITTER.

winding of induction coil I. By tracing the circuits with the key shown one way or the other it will be found that A can receive from B, while she can reach A to talk, but B cannot, or conversely. B is put through to C and A talks to both, or the relations of A and B may be reversed. D is a balancing resistance.



679,405—MICROTELEPHONE.

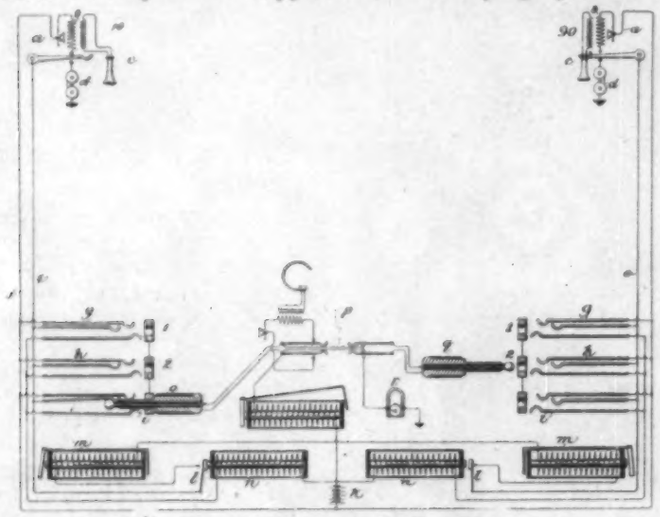
678,972.—J. G. Nolen. Telephone Transmitter.

This is a microphone of the "solid back" type, in which the familiar arrangement of a cup carried on the bridge, and

plunger carried on the diaphragm, has been reversed. The cup or chamber, shown at a-a′ in the figure, is supported on the diaphragm with an electrode a^4 within it. The twin electrode a^3 is carried on a stem a^2 that passes out through an opening in the cup a, and is secured in the bridge A^2. Inside and outside of the cup springs a^5 and a^6 are provided, which are really concaved spiders, centrally perforated to pass on the stem a^2. By screwing up or down the nut a^{11} on the stem the electrode a^3 may be adjusted in its cup, and the two springs tend to increase the reactive power of the parts in vibration, like the auxiliary mica diaphragm in the White transmitter.

679,405.—E. Volkers. Microtelephone.

This is a form of so-called "combined receiver and transmitter." It consists essentially of a pair of parallel wires CC looped at the upper end, and carrying upon them

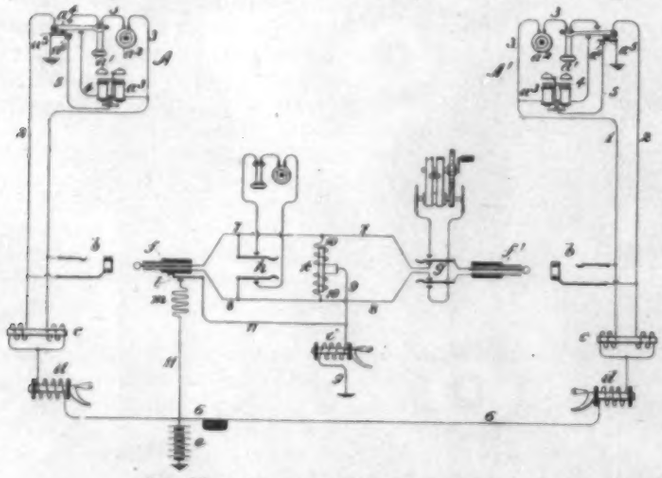


679,731—TELEPHONE EXCHANGE SYSTEM.

two boxes A and B, within which the operative parts of the instrument are contained. D is a handle. G is a tube carrying the circuit wires. The most noticeable feature of the device is that of making the lids of the two containing boxes serve as the diaphragm.

679,731.—W. M. Davis. Telephone Exchange System.

This is an improvement on some of the Stromberg-Carlson systems, having cut-off relays for the line signals



679,788—TELEPHONE EXCHANGE SYSTEM.

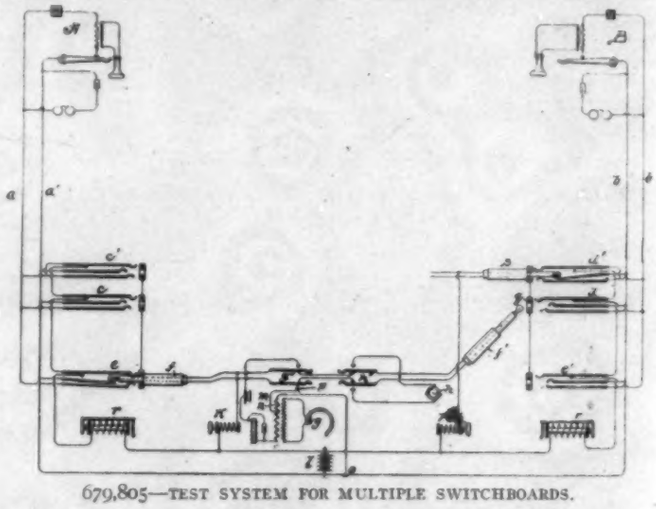
and a three-spring jack. The subscriber closes the circuit at the substation by raising his receiver, and current from battery k flows over line f through line signal magnet m. When plug is inserted springs g and i become connected through the plug sleeve, and circuit of relay n is completed, which thereupon breaks the line signal circuit at l.

679,788.—D. Sinclair and W. Aitkin. Telephone Exchange System.

This is a common battery system, wherein all the signals are kept retired by a normal flow of current. Current is flowing all the time. Signals are displayed by cutting off the current or by shunting them. All the metallic circuits are employed in parallel as one conductor, with neutral grounds. 1-2 are line wires over which current normally flows in parallel from battery e, through signal a, and to ground from the middle point of ringer windings. The breaking of this ground circuit at a^6 causes the flow to cease and the signal to show. When a plug is in current flows in parallel from battery e to and through line signal a and supervisory i, and when the subscriber hangs up he shunts signal i by his ground, and the clearing-out signal shows.

679,805.—H. G. Webster. Test System for Multiple Switchboards.

This is a simple addition to the Stromberg common battery circuits, for test purposes. The normal bridge across the cord for the operators' set is from one side of battery l through point o, to coil n and the transmitter to spring g′ and thence through resistance k back to battery. For testing an additional connection is made from part of coil n to

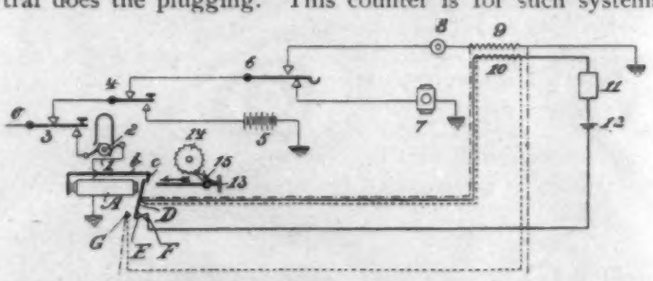


679,805—TEST SYSTEM FOR MULTIPLE SWITCHBOARDS.

point p, on the opposite conductor of the cord from k. If another plug is already in a jack of the tested line, as at s, the sleeves q are all on the k side of battery, and the touching of a tip thereto sends current through partial coil n by wire m, and gives a click, the resistance k limiting the current flow.

679,998.—G. Seligmanlin. Counting Telephonic Messages.

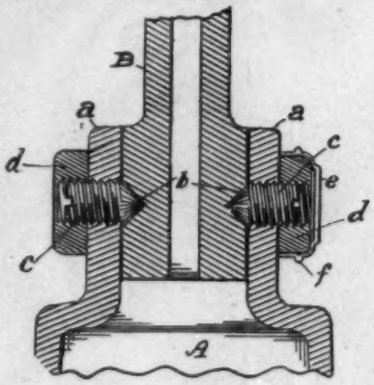
It appears that in some countries there still exist systems where the subscriber does his own ringing up after central does the plugging. This counter is for such systems.



679,998—COUNTING TELEPHONIC MESSSAGES.

The line to central is shown at o, and all the apparatus in the figure is at the subscribers' station. As the usual symbols are not employed, it may be said that 4 is calling key to connect battery 5 to line, to call central; 6 is the switchboard, 8 is the receiver, 9 secondary of induction coil, 10 the primary, 11 the transmitter, 12 local battery, and D the

shutter of a sort of drop annunciator that is included with generator 2 :n a branch put to line by key 3 when someone is to be rung up. When the subscriber calls central by key 4 and the connection is up he presses key 3 and rings. Current from the generator energizes magnet A and throws down drop D, breaking the local circuit 11-12. The only way the drop can be raised and the circuit restored is by a push rod 13, which scores on the indicator.



680,077—TELEPHONE TRANSMITTER ARM JOINT.

680,077.—H. B. Sabin. Telephone Transmitter Arm Joint.

This is a hollow arm with conical depressions and conical bearing screws holding it in the bearing plates. Cap nuts cover the screw heads.

DECISIONS AFFECTING TELEPHONY.

PREPARED FOR TELEPHONY BY ANDREWS & MURDOCH, BERRIEN SPRINGS, MICH.

USE OF POST ROADS.

The determination of a suit involving the right of telegraph companies to construct lines along military and post roads of the United States is of interest to telephone companies on account of the similarity existing between them. Such a case was recently decided by the Circuit Court for the western division of New York and appears in 108 Fed. Rep., p. 926. The action was brought by Benjamin F. Kester against the Western Union Telephone Company. Kester was the owner of land adjoining a post road of the United States. The telegraph company erected poles along the road and Kester brought action against the company for damages. The company answered, setting up as a defense the fact that the road was a post road of the United States and claimed to have complied with the requirements prescribed by the United States as a condition to its right to use such roads for the construction of its lines. On demurrer the court held that such defense was not sufficient, that the use of the highway for telegraph or telephone poles was an additional burden upon the fee and that damages were recoverable therefor.

FAILURE TO TRANSMIT MESSAGES.

Where telephone companies hold themselves out as being willing to transmit messages for a consideration they are held to be bound by the same obligations imposed on telegraph companies.

In the 63 S. W. Rep., p 1076, appears an opinion rendered by the Court of Civil Appeals of Texas in the suit of R. E. Taylor against the Southwestern Telegraph & Telephone Company. The complaint alleged that Taylor was a resident of Henrietta, Clay county, Texas; that the Southwestern Telegraph & Telephone Company owned and operated a long-distance telephone line to Wichita Falls and there made connection with the Carver and Wilson line, which ran to the town of Archer, and that the Southwestern Telegraph & Telephone Company held itself out to the public to place persons while at Archer in communication with persons at Henrietta, for hire, by means of its telephone line and connections; that in June Taylor's father, who resided at Archer, was dangerously sick; that the telephone companies kept night agents at Henrietta and Wichita Falls for night work; that on the night of June 6 Taylor's father became worse and his brother requested the agent of the Carver and Wilson Telephone Company at Archer to put him in communication with plaintiff at Henrietta over the connecting lines of telephone; the agent at Archer endeavored to do this, calling repeatedly between 10 o'clock of that night and 4 a. m. of the next day for the agent of the Southwestern Company at Wichita Falls, but was unable to secure a reply from the latter agent and was therefore unable to make connection desired. By reason of this failure the plaintiff was prevented from seeing his father prior to his falling into a state of unconsciousness preceding death, and deprived of an opportunity to talk over with his father matters of importance. The jury returned a verdict for $1,000 in favor of the plaintiff and the decision of the lower court was sustained.

DISCRIMINATIONS IN SERVICE.

It has been held that telephone companies must furnish 'phones to those desiring them and tendering payment therefor, irrespective of a failure of the customer to comply with previous contracts. Such a case is reported in 39 S. E. Rep., p. 257, entitled State ex rel. Gwynn vs. Citizens' Telephone Company. Gwynn was engaged in the grocery business in the city of Spartanburg, S. C., and occupied a residence in that city; the telephone company was operating an exchange in that city and had a franchise from the city giving it the privilege of erecting its poles and maintaining its lines along the public streets. In 1899 Gwynn had the Citizens' Telephone Company place 'phones in his residence and place of business, agreeing at the time that he would use the 'phones of that company exclusively. Many other subscribers signed similar agreements, but some customers, including one groceryman, were furnished 'phones under agreements which contained no such stipulations for exclusive use. In 1900 Gwynn purchased a market immediately joining his grocery store and cut a doorway between so as to connect the two departments. In the market there was a 'phone which had been placed there by the Bell Telephone Company, and this 'phone Gwynn continued to use. The Citizens' Company, against Gwynn's protest, then removed the 'phones from the latter's residence and place of business, claiming that, under its agreement, Gwynn's right to the service was dependent on his exclusive use of the 'phones of the Citizens' line. Gwynn tendered the amount due for the service and demanded their reinstatement, and upon refusal of the company to comply with the demand brought mandamus proceedings to compel the company to replace the 'phones.

The court held that under the constitution of South Carolina a telephone company is a common carrier of news and bound to supply all alike, who are in like circumstances and without dicrimination. In the course of its opinion the court quoted approvingly from the case of the State vs. Nebraska Telephone Company, 22 N. W. Rep., 237, the following language: "That the telephone, by the necessities of commerce and public use, has become a public servant, a factor in the commerce of the nation, and of a great part of the civilized world, cannot be questioned. It is, to all intents and purposes, a part of the telegraphic system of the country, and in so far it has been introduced for public use and has been undertaken by the respondent be held to the same obligation as the telegraph and other public servants. It has assumed the responsibilities of a common carrier of news. Its wires and poles line our public streets and thoroughfares. It has, and must be held to have, taken its place by the side of the telegraph as such common carrier."

So, in Chesapeake & P. Telephone Company vs. Baltimore & O. Telegraph Company, 7 At., 809, "The appellant (the telephone company) is in the exercise of a public employment, and has assumed the duty of serving the public while in that employment. * * * The telegraph and telephone are important instruments of commerce, and their services as such have become indispensable to the commer-

cial and business public. They are public vehicles of intelligence, and they who own and control them can no more refuse to perform impartially the functions that they have assumed to discharge than a railroad company, as a common carrier, can rightfully refuse to perform its duty to the public. They may make and establish all reasonable and proper rules and regulations for the government of their offices and those who deal with them, but they have no power to discriminate, and, while offering (themselves as ready) to serve some, refuse to serve others. The law requires them to be impartial, and to serve all alike, upon compliance with their reasonable rules and regulations."

CONFLICTING FRANCHISES.

Franchises granting to electric light companies the use of streets for the erection of poles are governed by principles applicable to telephone companies and decisions affecting the former equally affect the latter. A question of the conflicting rights of electric light companies to the use of the streets was passed upon by the Supreme Court of Pennsylvania, a few days since and appears in 49 At. Rep., at page 766. The case was one of the Edison Electric Light & Power Company against the Merchants' & Manufacturers' Electric Light, Heat & Power Company. The Edison Company held a franchise from the city granting it the use of its streets for erection of its poles and the maintenance of its lines. The Merchants' Company possessed a similar franchise of a later date. The Edison Company commenced injunction proceedings against the Merchants' Company, alleging that the latter company was interfering with it by placing its wires so as to run near and between the wires of the Edison Company and in dangerous proximity thereto. In passing on the case, the court held that "between two corporations exercising similar franchises upon the same street, priority carries superiority of right. Equity will adjust the conflicting interest as far as possible, and control both, so that each company may exercise its own franchises as fully as is compatible with the necessary exercise of the other's. But if interference and limitation of one or the other are unavoidable, the latter must give way, and the fact that it is under contract with the city for work of a public nature does not alter its position, or give any claim to preference.

MUNICIPAL TELEPHONES IN FOREIGN CITIES.

In English cities, as well as those of other foreign countries, the municipal telephone is the competitor of the private companies, while in the United States the independent telephone companies are the ones which furnish competition. A great reduction in the price charged for telephone service has been the result in each instance, and the reduction is likely to be still greater within the next decade, says the Municipal Journal and Engineer. The use of the telephone in both foreign and American cities has grown to enormous proportions.

Recent returns show that Norway has one telephone to each 144 of population; Sweden, 147; Luxembourg, 160; Switzerland, 172; Denmark, 211; Finland, 328, and the United Kingdom, 636. Among the cities of Europe, Stockholm probably marks the highest development of telephony yet seen. One person in every fourteen has a telephone there, there being more than 20,000 telephones in use in a population of 271,000.

London has more than 5,500,000 people and only some 10,000 telephones. The charges in London range up to $100 per year, while the State department asks only $14 per year for the same class of service in Stockholm. With the unlimited right of call the total cost of the telephone in Sweden is only $22; in Manchester, England, the charges run up to $50 per annum. In Sweden there are telephones for smaller users with limited right of calling, and the charges are proportionately lower. Every tobacconist's store in Stockholm, of which there are more than 700, is a public call office.

While the per capita number of telephones in Great Britain is less than in the other countries mentioned, the aggregate amount of business done is not so far behind. The telephone business of the United Kingdom is under the control of the National Telephone Company, with head offices in London. There are 988 exchanges throughout the country, which take care of 202,200 stations or subscribers, with the enormous number of 682,857,864 messages per year. The business of this company is steadily growing in spite of the opposition of the municipal telephones which are springing up all over the Kingdom. The National Telephone Company has added 29,221 subscribers to its list during the last fiscal year, and the business, or number of messages, has increased 15.3 per cent, while the Post Office telegraphs, which are operated by the government, transmitted only 90,000,000 telegrams, which shows an increase of only 2.88 per cent over the business of the previous year. The friends of municipal ownership and those who favor governmental control and operation of such public utilities as the telegraph, telephone, express and similar lines of business, are expecting an enormous increase in the amount of business during the next five years and have no hesitation in predicting the downfall of the companies from lack of patronage.

In Glasgow the fight between the National Company and the municipal telephone has been on for some months past. On January 1, 1900, the municipal telephone system had not gotten under way and had practically no subscribers, but at the present time it has about 6,000 patrons to 9,000 of the National Company. Half of the patrons of the former use both systems. The municipal charge is $26 a year for an unlimited service, and the National charge is $50. The municipal business is growing at a tremendous rate, and the authorities are now laying conduits which will accommodate 10,000 wires, and in some localities provision is being made for 16,000.

The following table will afford a means for comparing the amount of business and the rates in various European cities:

City.	Subs.	Ratio.	Charges.
Amsterdam	1,925	1 in 260	$36
Berlin	28,785	1 in 80	36
Bergen	1,800	1 in 38	19
Berne	2,000	1 in 27	20
Cologne	3,784	1 in 85	36
Christiania	6,475	1 in 30	22
Frankfort	3,909	1 in 59	36
Florence	900	1 in 277	$30 to $40
Ghent	900	1 in 222	40
Hamburgh	12,064	1 in 56	36
Helsingfors	2,800	1 in 28	$16 to $28
Munich	1,864	1 in 230	36
Prague	2,200	1 in 146	21
Rome	2,162	1 in 238	33
Rotterdam	1,320	1 in 224	$27 to $37
Stuttgart	3,363	1 in 47	25
Stockholm	19,369	1 in 14	22
Trieste	1,003	1 in 165	21
Vienna	10,673	1 in 132	41
Zurich	4,400	1 in 35	$8 to $20

In Switzerland the telephone system is under state control, and in Zurich, with a population of 150,000, there is one subscriber to every thirty-five persons. The manner of making the charges for the telephone service in this city varies radically from the practice in other cities. For example, a subscriber is charged $20 for the first year's service; $14 for the second year, and $8 for the third and succeeding years, with a charge of one cent per conversation.

The Bell Telephone Company, which has long been in a legal controversy with Richmond, Va., to continue to operate its plant there, was defeated in the board of aldermen by a vote of 9 to 8. The board decided to lay the Bell petition for a franchise for 30 years on the table until after the decision of the United States Supreme Court, in which is now pending the case of the city of Richmond against the Bell Company in the effort to run it out of the city. For years the Bell Company has been fighting the city.

BRITISH TELEPHONE NEWS.

(From our London Correspondent.)

The most important telephonic event of the month has been the official opening of the Tunbridge Wells municipal telephone service, which is the first of its kind under the Telegraphs (Telephonic Communication) Act of 1899. The Lord Mayor of London performed the opening ceremony and needless to say, there were great local rejoicings. As a matter of fact, however, the exchange has been in partial use for some months past. It would appear that the National Company, after attempting to purchase the Corporation's license cut down their subscription rates by some 50 per cent as mentioned in my letter of last month. The municipal service has cost some £10,000 and covers an area of some 250 square miles. Three hundred and thirty subscribers are at present connected and the inhabitants generally seem to be supporting the corporation very loyally against the National Company. The charge is just under £6 per annum for unlimited service, and the following toll rates for small users, viz: £3 per annum and ½d per call and £2.8s per annum and 1d per call. Mr. A. R. Bennett is responsible for the organization of the system and he has arranged the exchange room on the ground floor. The switchboard and system generally embodies several novel features, one of the chief of which is that the conversation cannot be overheard by the operator. All the conductor's leaving the exchange are carried underground through the town; but beyond that overhead wires are employed. At present there is a total of over 10 miles of cable laid which actually represents some 700 miles of single conductor.

The service at Tunbridge Wells can necessarily never be a very extensive one and the chief importance attaching to it is that this is the first instance for a municipally controlled telephone service in the United Kingdom. In Glasgow, however, a much larger area is being equipped and the system is expected to be publicly opened in a few months. In fact, up to the present over 5,000 applications have been made for connection. At the moment the Glasgow corporation is giving telephone service in competition with the National Company, to the exhibitors at the Glasgow Exhibition, and Mr. A. R. Bennett who has carried out the Tunbridge Wells undertaking has been appointed manager of the telephone department in Glasgow.

The National Telephone Company has recently been extremely busy in getting protective clauses inserted in several bills authorizing extensive systems of overhead trolley tramways. This defines the liability of the tramway authorities and the telephone company respectively in the event of the two sets of wires coming into contact with resultant harm to property or persons. Of course, the telephone company has not always been successful in getting such a clause embodied, but its attitude in this matter has brought maledictions upon its head from several quarters. For instance "Electrical Investments" a private journal published in the interests of a large electric traction company, takes the National Company to task and accuses it of unfairness and unreasonableness, basing its argument on the fact that whereas all tramway companies are obliged to undergo Government inspection before their lines are allowed to operate such a thing is unheard of in connection with overhead telephone construction, thus hinting that whereas it is always safe to assume that a tramway undertaking is in a fit condition to work when passed by the Board of Trade inspector it does not always follow that telephone wires are in a safe condition when allowed to work by the company. On the face of it, this action on the part of the telephone company is a somewhat bold stroke, but inasmuch as they have in some cases got what they asked for, the end must be said to have justified the means.

A more congenial topic in connection with the National Company, is the matter of its half yearly accounts. After putting £65,000 to reserve and carrying about £6,000 forward, it has declared dividends for the half year to June 30 of 6 per cent per annum on the 1st and 2nd preference shares, 5 per cent on the third preference shares and 5 per cent on the ordinary shares. A significant item in the accounts is a sum of over £17,600 which has been charged against revenue as the special expenditure necessary to repair the damage to wires, etc., caused by the snowstorms at the beginning of the year. In view of this large sum, which is a feature of the company's accounts each year, one can hardly agree with the policy which is being adopted in so many provincial towns of putting up overhead wires. At Tunbridge Wells, for instance, during the construction of their overhead equipment at the time of the aforesaid snowstorms, many of the wires then erected were brought down again. Brighton too, intends to use overhead wires and so do many others, but in the light of experience, it seems an unwise policy especially with the example of the General Postoffice authorities putting all their London system underground, before their eyes.

Apropos of the Government system in London, the reply to a question in the House of Commons that the tariff would be fixed as soon as subscribers could be invited to join does not convey the impression that subscribers were forthcoming in any great numbers. The Postoffice authorities, however, have advertised for telephone exchange girls at 11s per week, over which a great deal of adverse criticism has been addressed to the daily press pointing out the absurdity of this as a living wage for a girl.

The Brighton local authority, which will shortly commence laying its wires, has decided on the following tariff. For an unlimited service £5 10s per annum. For limited service £3 10s per annum and 1d per call. The charges to subscribers in districts outside Brighton proper shall not extend at any time to those in force for the time being in Brighton, but at the same time, the corporation has safeguarded itself by retaining the right, in the event of these charges not being sufficient to make the undertaking financially successful, to increase them both in Brighton itself and outside as well. The charges above mentioned only apply to subscribers within a mile of the nearest exchange.

Many towns are now waking up in the matter of their telephonic service. For instance, at Dundee, in Scotland, the town councillors are of the opinion that they should either have a municipal exchange or give facilities to a local company to compete with the National Company. Down in the South of England, at Portsmouth, the work of fixing the equipment is being proceeded with in spite of the fact that sanction has not yet been received from the local Government Board. Further along the same coast, the Eastbourne municipality is said to be entering into an agreement with the National Company for the latter to purchase its powers under the Telegraphs (Telephonic Communication) Act for a term of 21 years, which, if correct, is a state of affairs not foreseen in official quarters. At Sunderland great progress is being made by the National Company in establishing a more efficient service, and thanks to the corporation of the local authority the wires have all been placed underground, whilst at the exchange bells are susperseded by lamp signals. At Barnsley, Oldham, Aberdeen, Huddersfield and numerous other places dissatisfaction with existing conditions under the National Company is causing the local governing bodies to seriously contemplate competition.

TELEPHONE SYSTEM IN AUSTRALIA.

Not a single telephone system in Australia is equipped with modern apparatus. Of them all, perhaps the Melbourne system, with a switchboard 30 years old in its central exchange, lags farthest behind. An interstate conference of the electrical experts attached to the several postal departments met in Melbourne to consider how the Australian telephone system can best be standardized and placed upon a uniform basis. Each of the experts can, of course, speak with authority upon the defects of the exchanges in his own state, but in order that all of their number may be personally acquainted with the different systems, the various capitals will be visited in turn.

HOW JACK PROPOSED.

BY FRANK GOEWEY JONES.

Write her a letter? No, that would not do. Written are but stiff, bloodless corpses of spoken words. Expression is dead; emotions represented by mere punctuation marks. A period is not equivalent to the silence of an unspoken thought. An exclamation point bears no resemblance to blood surging in a lover's veins. The thought of trying to record on paper, with a pen and ink, the passion of his heart almost cooled the ardor of his love. He would not impoverish the wealth of longed-for happiness by a crude expression of his hopes. He must speak to her, and the fervor of his words should sweep every obstacle from the path of his resistless love. Yet he knew that once confronted with the sunshine of her smile, and the blue heaven of her eyes, his bewitched tongue would falter and refuse its eloquence in speechless love of her. He would blunder into a morass of embarrassment, like a clumsy fool. In his mind, to be ridiculous was to be doomed.

Sitting cross-legged on the floor, staring into the dull

red embers of a grate fire, puffing clouds of tobacco smoke, Jack Barton pondered. He loved Marion Lewis with the fervor of ambitious optimism. Were she his wife there could be no doubt of his future happiness. With her as an incentive, there was no goal too far distant to be reached. Without her, his life would be an arctic night of misery. In reality, of course, he would never have been half so unhappy as in his imagination's picture. Disappointment in the first love rarely kills, but dread of coming suffering is often worse than endurance of the actual pain. Doubtless it was foolish of him, but, sensible or senseless, there was no doubt that Jack was miserable.

He pulled hopefully at his pipe, but the tobacco smoke would not spell out an answer to his question. His forehead was drawn down into a knot between his half closed eyes. His mouth was twisted to one side, in rueful misery. His tousled hair in helpless sympathy could not decide how or where it should lie down, and therefore stood in various attitudes of dejection, all over his head, one tired clump resting on another, mute witnesses of where his restless hands had passed. There was tragedy and comedy disputing the stage, in the absurdly mixed gravity and helplessness of his face.

He was firm in his resolve to ask the fateful question, yet he knew that his determination would melt in her warm presence until only a muddy pool of strengthless water remained.

Rising, he returned his pipe to its place on the mantelpiece, and walked to a distant corner of the room, where a tiny cupboard was set into the wall. This opened, displayed a bottle and several small glasses. Jack carefully filled one of them from the bottle and before closing the cupboard door twice repeated the operation. Now, three four-finger drinks of good old rye, swallowed in the space of as many minutes, and taken straight at that, have a tendency to produce uncertainty of thought and action. Jack Barton was not a heavy drinker. His digestive machinery was not accustomed to such treatment. As the fumes of the liquor mounted to his brain, his ideas of the surroundings became first vague and then mistakenly intense. He did not try to sit down, but leaned heavily against the wall, which alternately approached near and then receded from his back, leaving him uncertain of support. His legs, as happens with some men, became intoxicated first. His knees grew hilari-

ous and wobbled about and knocked against each other in a tolerably successful expression of their blissful state. His arms were next affected and flopped aimlessly in an endeavor to recover the use of his hands, which tingled with a numbness, seemingly an interminable distance from his body. His head rolled from one side to the other of his chest, jerkily, as a heavy pendulum might move upon a rusty arm. His movements were characterized by the gracefulness of a sawdust doll, half emptied of her vital stuffing.

He was drunk. No one would question that. But his mind was clear. He had very definite and certain thoughts on many subjects; strange thoughts, some of them, on strange subjects; but though his logic was that of a drunken man, it was still logical. Pervading every thought of other things was the dominating remembrance of his love. It persisted in showing itself to him in uncouth failure or beautiful success. When a man is drunk, as Jack Barton was, and still remembers that he is in love, and more remarkably, with whom, the most skeptical must be convinced.

With him also intoxication had not one bit abated his fixed resolve to declare his feelings to their object, on that very night. There is a strange fatality which makes some

drunken men desire to be nearest the women whom they love at the moment when they least should wish to be seen by anyone. It is a strange, unexplainable paradox, but true. It is certain that no man is properly drunk unless he violates every rule of common sense which characterizes his sober acts. Jack Barton being undoubtedly drunk, was equally undoubtedly fired by an increased devotion to his love. Before drinking the whisky he hesitated to ask her to be his wife; afterward, while his limbs still were dubious, his mind was fixed.

He was not drunk enough to forget that he was drunk, nor to imagine that she would not notice his condition if he presented himself to her in his present state. Nevertheless, he would speak to her at once. It would not be an easy thing to do. She must not, in any case, have a scent of his whisky-perfumed breath. She would never help brace him on his knees while he made his avowal.

And still his pendulum head swung upon his chest.

Drunken men almost always are determined. The more difficult the task the firmer their resolution to accomplish it. Often they are shrewd, too, and find ways and means which their sober, better sense would never countenance. So it was with Jack. A sudden inspiration came to him. He would telephone to her, and the 'phone would transmit the message and omit the breath. The idea was such a daring one that it almost sobered him, but it took all the will he had to uphold his courage after he had taken down the receiver and given her number to central. Luckily for him she was alone at home, and answered the call herself.

He did not hesitate, but plunged headlong into his avowal. Never before or since were warmer or more eloquent words poured into a telephone transmitter. They were like molten gold, fresh taken from the furnace of his heart. He told her of his loneliness, of his hopes and of his fears. His voice broke as he pictured the fairyland of his home, with her as its dear mistress. Tears came to his eyes when he spoke of his ambitions and her part in them. He pleaded, begged, implored, almost commanded her love; in return promised her the eternal fealty of his heart, the unselfish devotion of his life to her happiness. He admitted his unworthiness, and tha. she was as distant from his just deserts as was the faintest star in heaven from the earth. He told her that he loved her passionately, fiercely, fearfully and hungrily. His days were waking dreams of her sweet face. His nights were bright with visions of her as his wife. His heart was bursting with his love of her and thrust his words tumbling heedless, but in eloquent confusion from his lips. At the end he could only falter her name, caressed with endearing adjectives, a great lump came into his throat and a mist covered his eyes. He realized what he had done.

It is not for profane ears to hear the answer that came over the wire, but it was good to see Jack's face as the clouds of uncertainty were swept away, brightening, as snow upon a mountain top first touched by the sun, warming first into a soft and later into a brilliant radiance of joy. The hidden mysteries of love were all laid bare to the simplicity of children. Jack's voice was very tender as he said good-night, and he was very thoughtful as he hung up the receiver and turned away from the 'phone. He stood a moment on the hearth rug looking into the ashes of the dying fire, and then, strangely, in view of his great happiness, he fell upon his knees in a passion of tears.

TELEPHONIC SECRECY.

An attachment is provided in Sweden by which the secrecy of the telephone line is assured. The apparatus, which is rented at a moderate rate, indicates whether or not the telephone operator is listening to the conversation.

"We like the paper well. Don't want to miss a number.
L. P. COOK, Mgr.,
Toccoa Telephone Co., Toccoa, Ga."

LETTERS TO TELEPHONY.

TELEPHONY, Chicago, Ill.

Gentlemen:—Our company believe the government should own trunk lines all over the United States and run them the same as they do the postal business, then connect on all telephone companies, the Bell as well as the Independent telephone companies. This would make a uniform system and give the people good telephone service at rates similar to the postal rates. Please investigate and push this in TELEPHONY. Very respectfully,

PEOPLE'S TELEPHONE EXCHANGE,
Brandon, Vt.
Per F. E. Chandler

Editor TELEPHONY, Chicago, Ill.

Dear Sir:—Last spring I became interested in the organization of an Independent telephone company in this county, known and incorporated as the Winnebago County Telephone Company.

We secured a franchise in the county and in all of the smaller towns and applied for a franchise in this city, but were unsuccessful, Messrs. Bills and Wortham securing the franchise. They are now organizing a local company and preparing to build. We own the franchises in the smaller towns and the county and have several hundred subscribers signed up at $24 and $18.

We can make satisfactory arrangements for connection in Rockford with the exchange that is now being organized, and I am of the opinion that if we had a man associated with us who could take up the matter of organization and construction, this county could be built and show a good profit.

Can you place us in communication with someone whom you think might become interested in building this county? It is one of the best and most prosperous counties in the state and the farmers and country merchants are anxious for service, as the Independent telephone movement has been freely advertised here lately. Very truly,

H. S. HICKS,
Rockford, Ill.

TELEPHONY, Manhattan Building, Chicago, Ill.

Gentlemen:—This company will immediately begin the construction of an exchange of 1,500 'phones, and is in the market for the entire equipment necessary. The work includes several miles of underground construction.

Very respectfully,
THE HOME TELEPHONE COMPANY,
Jamestown, N. Y.

Publishers of TELEPHONY, Manhattan Building, Chicago, Ill.

Gentlemen:—Your late edition had a very long and exhaustive article on "The Modern Telephone Switchboard." It was very interesting, but there was some information which I wish to get and which it did not contain, viz.:

(1) How many (or about how many) telephones in use in the United States, in connection with switchboards or central stations?

(2) What number of operators are employed in the operation of these switchboards?

(3) What amount, or about what amount, is paid out annually for wages and salaries to these operators?

I suppose there is no one more likely to be able to reach this information than your company is and if you will kindly give me as nearly as possible the figures on these three points I will be much obliged to you.

Yours truly,
J. W. CHISHOLM,
Baltimore, Md.

TELEPHONY, Chicago, Ill.

Dear Sirs:—In the July number of TELEPHONY the question, "What shall we call a message sent by telephone?" Allow me to suggest that phon-e-gram be the word. TELEPHONY is the medium in which to settle this question.

Respectfully,
B. FRANK HOCKMAN, M. D.,
Sumner, Ill.

TRADE NOTES.

THE BURR MANUFACTURING COMPANY, Cleveland, Ohio, will send upon request its latest catalogue of the different Burr specialties.

THE HAZARD MANUFACTURING COMPANY, Wilkesbarre, Pa., is distributing some very attractive booklets describing its bare copper wire, insulated wires and cables.

THE STANDARD TELEPHONE AND ELECTRIC COMPANY of Madison, Wis., will send its latest booklet, entitled "Six New Facts," to any address upon request.

THE INTERNATIONAU TELEPHONE MANUFACTURING COMPANY, Chicago, announce that it has now ready for the market its complete line of telephone equipment.

THE COUNTRY HOME TELEPHONE COMPANY, Chicago, have a telephone message for you in the shape of a little book of more than ordinary interest. It will be sent free for the asking.

THE WILLIAMS ELECTRIC COMPANY, Cleveland, Ohio, want telephone men to write for the book entitled "G. T. & T. Co.," also its leaflet, "Something New," which will be sent free upon request.

THE GENERAL ELECTRIC COMPANY, London, England, will be glad to send a copy of its latest 100-page telephone catalogue upon request. The catalogue contains much of interest to telephonists generally.

THE ELECTRICAL APPLIANCE COMPANY has just placed upon the market a new cabinet type wall telephone for both series and bridging work. Special descriptive matter will be sent upon application.

THE AMERICAN TOLL TELEPHONE COMPANY, Cleveland, Ohio, is the publisher of a book on "Slot Machines for Telephones," which will be mailed free upon request as long as the edition lasts.

THE CLARK AUTOMATIC TELEPHONE SWITCHBOARD COMPANY, Providence, R. I., has recently received an order for its specialties from South Africa for the Cape government railway service.

W. N. MATHEWS & BROS., St. Louis, are mailing to the trade a unique color card introducing their traveling salesmen. The card is attractively gotten up and will be sent to anyone interested in Stombaugh Guy Anchors.

THE SWEDISH-AMERICAN TELEPHONE COMPANY, Chicago, is sending out a number of testimonial letters bound in a paper cover and entitled "What the Users Say." These letters are worth reading and will be sent postpaid to any address upon request.

THE SUMTER TELEPHONE MANUFACTURING COMPANY, Sumter, S. C., has issued a new book entitled "Perfection in Telephones," which is interesting and instructive. It will be sent postpaid to any one mentioning this publication.

THE VOUGHT-BERGER COMPANY, La Crosse, Wis., reports large sales of its telephone apparatus both in this and foreign countries. The company will send its "Vought Pendent Telephone Booklet" postpaid to any part of the world upon request.

THE WARNER ELECTRIC COMPANY, Muncie, Ind., has ready for mailing a booklet of more than ordinary interest which will be sent free upon request. It is gotten up in an attractive manner and telephone men will find some valuable information therein.

THE INTERNATIONAL PUBLISHING COMPANY, Grand Rapids, Mich., is making a special offer of its telephone circuits as follows: 15 magneto combinations, 50 cents; 11 central energy and house systems, 50 cents; 15 wiring of telephones of some of the leading manufacturers, 50 cents; any two sets, 80 cents; all three or 41 diagrams, $1.00. These circuits are in great demand and are invaluable to the exchange manager.

THE STANDARD TELEPHONE & ELECTRIC COMPANY, Madison, Wis., is sending out a book entitled "Six New Facts," which contains a number of letters from exchange men and other data which is very readable. The book will be sent upon request.

THE STERLING ELECTRIC COMPANY, Lafayette, Ind., reports a continually increasing demand for Sterling apparatus. The company has recently secured contracts for large exchange equipment. Toledo, Ohio, being one of the latest cities to adopt Sterling equipment.

THE ACME ELECTRIC COMPANY, Chicago, has just issued a very attractive folder entitled "A Simple Story." It contains a description of the new Acme transmitter. The company will send the folder to you upon request.

THE SWEDISH-AMERICAN TELEPHONE COMPANY, Chicago, reports that it is receiving hundreds of inquiries for its book on the telephone which is now off the press and being distributed. The company has produced a valuable book of some eighty-four pages which will be sent gratis.

THE KNECHT BROTHERS COMPANY, Cincinnati, Ohio, is sending to prospective buyers a circular describing its friction sensitive drill press which gives variable speed without cone pulleys or shifting of belts. The machine will be placed on thirty days' trial to responsible parties. Correspondence is solicited.

THE ELECTRICAL CONSTRUCTION SUPPLY COMPANY, Springfield, Ohio, has just issued a booklet illustrating and describing the chubbuck patent malleable iron brackets, pins and break arms, its automatic suspension pulley and a number of other specialties. The booklet will be sent free upon request.

THE INTERNATIONAL SPECIALTY COMPANY, Chicago, report that the Schwarze telephone is in great demand and giving universal satisfaction. The company manufactures a complete line of woodwork for telephone companies, including backboards, battery boxes, booths, etc. Correspondence is invited.

MR. C. M. DOUGHERTY, Grand Rapids, Wis., general Manager of the Wood County Telephone Company, has opened an instrument repair shop and will be pleased to correspond with those having repair work to be done. Mr. Dougherty has had a wide experience in telephone work. A line of telephone and electrical supplies will be carried in stock.

THE HARVARD ELECTRIC COMPANY, Chicago, is mailing to the trade its latest descriptive circular and illustrated price list. The booklet contains illustrations and descriptions of the company's product, while the front cover is embellished with a half tone of President Greer. A card accompanies the booklet with the admonition to "Do it now" copies will be sent upon request.

THE ERICSSON TELEPHONE COMPANY, New York, has just issued part 6 of the Ericsson Series, containing some interesting information concerning intercommunicating telephone systems, especially in regard to the Ericsson system, which is illustrated by a diagram. Some valuable statistical information is given concerning the telephone system of Belgium.

THE UNITED STATES ELECTRIC MANUFACTURING COMPANY of Butler, Pa., has been incorporated under the laws of New Jersey with a capital stock of $500,000 to do business in electrical goods, but principally in telephone equipment. The company owns patents on small automatic exchanges and also on a selective signal lockout, party line exchange service. All of this equipment will be manufactured in the Butler factory. The officers of the

company are: President, J. W. Brown; vice-president, M. A. Berkimer; treasurer, C. A. Bailey; secretary, W. H. Miller; superintendent, Fred E. Freers.

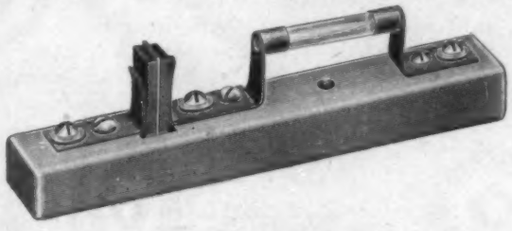
J. J. REIDY & CO., New Haven, Conn., are making a special offer to telephone buyers on the Donnelly steel climbers. These climbers can be secured from the Manhattan Electrical Supply Company, Chicago, the McIntosh-Huntington Company, Cleveland, Ohio, and W. B. Belknapp & Co., Louisville, Ky., at factory prices. The above companies carry a stock of Donnelly climbers beside a complete line of electrical and telephone supplies.

THE WESTERN ELECTRICAL SUPPLY COMPANY, St. Louis, has recently gotten out, under its own name, a new dry battery called the "Wesco." The battery is meeting with an extremely flattering success, as the demand for it is very large. This company is also getting out a new brand of friction tape called "Wesco," and states that this tape is to fill a long-felt demand for tape which is moderate in price and at the same time comparatively first-class.

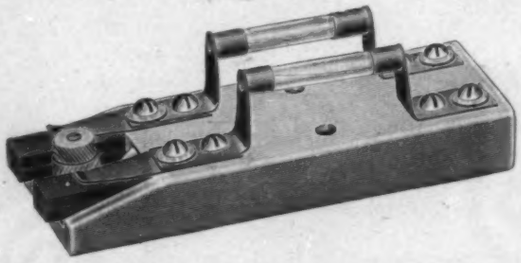
THE COLUMBIA TELEPHONE MANUFACTURING COMPANY, Chicago, states that it has more business than it can conveniently handle, although the company was only organized a few months ago. It has, however, made arrangements for increasing its facilities and will be in a position to meet the demands for its products in the course of a short time. The peculiar merits of the Columbia transmitter and of the other telephone appliances made by this company seem to have appealed strongly to exchange managers.

PROTECTION.

The accompanying cuts illustrate an entirely new departure in fuse blocks to be used in connection with telephones. The Chicago fuse block provides the well-known carbon and fuse combination in a form which, it is claimed, will overcome the many objections to the same combination



in other forms. The fuse is mounted in a glass tube and is therefore surrounded by an air gap for its entire length. No other substance is in contact with the fuse in such a manner as to increase its conductivity beyond the tested capacity. Therefore the Chicago fuse may be depended upon to "blow" when the tested capacity is exceeded. The Chicago Telephone Supply Company has designed this ar-

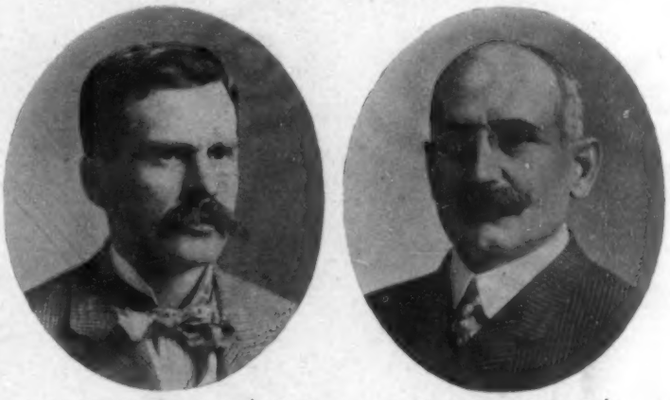


rester after exhaustive tests and experiments. Its success has been so instantaneous that it has been found expedient to mount arresters of this type on every Chicago telephone and distributing board.

This arrester illustrates anew the efforts and success of the Chicago Telephone Supply Company in making the name "Chicago" truly representative of all that is good and latest in telephone apparatus. A new illustrated pamphlet, No. 38, has been recently issued and copies will be sent to telephone men on request. Address, Chicago Telephone Supply Company, Chicago.

THE STANDARD OF MADISON.

The Standard Telephone and Electric Company of Madison, Wis., which was recently reorganized, and of which T. H. Gill of Milwaukee, Wis., is the president, A. L. Hutchinson of Weyauwega the vice-president and general manager, E. W. Batchelder of Madison secretary and treasurer, and J. J. Nate, superintendent, is preparing to vigorously push all lines of apparatus heretofore manufactured and also to equip its factory for the manufacture of central energy telephones and switchboards. The Standard is one of the pioneer manufacturing companies in the United States and was one of the few companies which contributed to the expenses of fighting the Berliner patent. It secured the exclusive right for the use and sale of the Milde transmitter for the United States in 1895 and has worked up a fine business in nearly every state in the Union.



A. L. HUTCHINSON, GEN'L MGR. E. W. BATCHELDER, SEC'Y.
STANDARD TELEPHONE AND ELECTRIC COMPANY, MADISON, WIS.

Among the larger exchanges equipped by the Standard Company are those of Portland, Oregon, Madison, Wis., Asheville, N. C., three diagonally opposite sections of the country, and its patrons scattered throughout the United States are numbered by the hundreds.

At the present time and for several weeks past the company has been handicapped by reason of a fire which occurred in the second story of its factory last May, destroying a portion of the building, which at that time was a wooden structure. The owners of the building have been reconstructing and transforming the old wooden structure into a fine brick block, while all the time the work of the factory has been going on uninterrupted, yet under difficulties. The new block will soon be completed and the factory force will then be doubled.

The general manager has just issued a little circular in which he tells of sending out letters to old customers asking for suggestions in the way of improving the apparatus manufactured by the Standard Telephone and Electric Company, recognizing the fact that there is always room for improvement, and containing many of the replies in which patrons are so well pleased with the Standard telephone that they say it stands without a rival; and one customer in particular states that among twenty different makes of telephones he considers the Standard superior to all others. But, recognizing that the best is none too good for the Independent companies, the company, under its present management, will spare no trouble or expense to so perfect all apparatus that it will stand second to none under any tests which may be given. Those who have dealt with the people connected with the company in the past have only the kindest words for the treatment accorded them, and it is safe to say that the company will not only retain all its own patrons, but gain many new ones.

THE WARNER RINGING APPARATUS.

The Warner pole changer is simple in its operation and scientifically correct. The current obtained from batteries is continuous or direct; that is, it flows only in one direction, and the Warner pole changer is simply used to alternate this direct current. It does this without the use of an induction coil; therefore, the voltage of the alternating current is the same as that of the batteries.

Most people have not considered the actual amount of power required to ring a polarized bell, but it is found that in an average telephone exchange of 500 subscribers over nine-tenths of the power consumed in driving the power generator is wasted in keeping the generator in motion while the operators are not calling. In fact, it is only necessary to use a very small per cent of the total consumption of the power for effective work.

WARNER DRY BATTERY RINGING OUTFIT.

There is no such loss in the Warner battery method of calling subscribers because there is no current being drawn from the ringing batteries except at the time of signaling. A closed circuit battery keeps the vibrator in motion continuously.

It is a guarantee that Warner machines will ring the heaviest toll lines, as they will ring over lines where all other generators fail. It has no limited voltage or amperage and will meet all conditions. Some users have as many as thirty or forty phones bridged on to one line and each phone rings distinctly. It makes no difference whether the lines are grounded or metallic, or whether series or bridged phones are used.

The above cut illustrates the dry battery ringing outfit. It consists of sixty best quality dry batteries, one type "RR" Edison Lalande battery, one special condenser, and one Warner pole changer, all contained in a handsome paneled oak cabinet, having glass cover as shown. The cabinet occupies a space of about 18x20 inches, and is about 40 inches high over all. When crated for shipment it weighs about 200 pounds.

The plug switch shown on front of cabinet is for the purpose of cutting the batteries in or out. Thirty batteries will meet most requirements, leaving a reserve of thirty.

The dry batteries are contained in the lower cabinet and are not in the circuit only at the time of calling a subscriber. The closed circuit battery which keeps the machine constantly alternating is contained in the upper cabinet.

The illustration below shows the Warner standard pole changer. It is mounted on an oak base, is complete

WARNER STANDARD POLE CHANGER.

with condenser and glass cover. The wood base has short nickel plated legs to raise it up so as to protect the condenser and make a very compact arrangement.

It is furnished as shown in cut, without batteries or cabinet.

One cell of any good closed circuit battery will operate the vibrator. This battery should not be placed too far away from the machine, but should be as close as possible and connected with wire not smaller than No. 16 B. & S. gauge copper. Of course, the power batteries may be installed at any convenient point, inasmuch as they are of a high voltage type. From thirty to fifty cells, connected in series, will usually furnish pressure sufficient to do the hardest ringing, although we have customers who claim that ten cells will do their work satisfactorily.

A NEW PIECE OF APPARATUS.

The accompanying diagrams show the operation of the new Keelyn multiple series bridging telephone. In a novel manner the ringer coils are adapted to be connected in series or multiple. Normally, the ringer coil is bridged into the line in series at 1,000 or more ohms resistance. The windings of the coil are tapped out into four, as above (or any

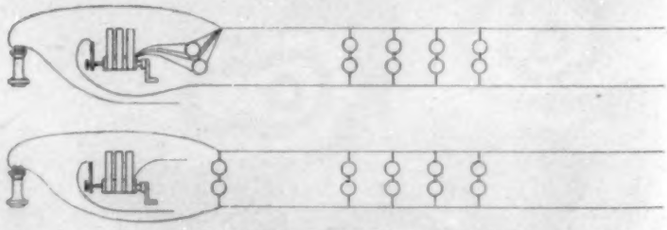


DIAGRAM KEELYN BRIDGING TELEPHONE.

number), of multiples. This is simply done by making contact with the switch spring. In the above diagrams top one shows the circuit when the user is in the act of turning the crank. The ringer coils being 1,000 ohms resistance in the multiple shown. The crank action automatically cuts out of "bridging" the 1,000 ohms resistance circuit, and cuts into circuit the generator and ringer coils in series with each other, the winding of the latter being in multiple. When

the operator releases the crank the ringer coil circuits are automatically changed back to their "bridging" position of 1,000 ohms. It is adapted to any standard resistance of bridging up to 5,000 ohms and is capable of multiplying to 15 ohms or less, as desired.

It is claimed that this type of bridging bell has all the advantages of the "Carty bridging bell," which it does not infringe in any manner. The "Carty Patent" expressly disclaims any rights over instruments in which the generator operates in series with the ringer coils. Nearly every bridging telephone now in use can be readily changed to the Keelyn type by a very simple re-arrangement, costing but a trifle.

The Keelyn Telephone Manufacturing Company are now constructing this device at 165 South Canal street, Chicago.

STERLING ELECTRIC COMPANY, LAFAYETTE.

The success of the Sterling Electric Company of Lafayette, Indiana, will be of interest to our readers as showing the growth and progress of this prominent telephone manufactory. As is known this factory was removed from Chicago, December, 1899, occupying a building comprising fifty thousand square feet of floor space. Its growth was such that in January it purchased additional building of like size, giving it something over one hundred thousand square feet of floor space. It is constantly equipping with new machinery to facilitate the handling of the constantly increasing business.

Its work has so grown, advancing into the telephone, multiple switchboards, and full common battery systems, that the capital stock of the company has been increased to $150,000 to enable it to handle this additional new work.

It is not necessary to enter into the merits of the goods manufactured by this well-known house, as they are recognized as a standard product throughout the Independent field; its switchboards, protective devices, terminals and telephones having a wide reputation.

Among the orders for switchboards varying from fifty to one thousand lines each, it has recently filled, are the following:

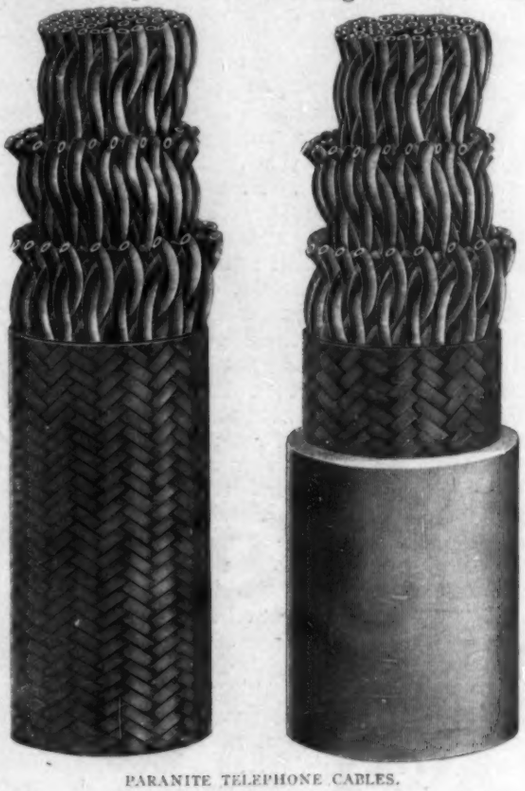
Marietta, Ohio, Tremont, Ill., Cambridge, Ill., Pittston, Pa., Decatur, Ill., Ottumwa, Ia., Sharon, Wis., St. Joseph, Ill., Cheboygan, Mich., Maglehurst, Miss., Greenville, N. C., Brandenburg, Ky., Freeport, N. Y., Columbus, Miss., Long View, Texas, Meadville, Pa., Fithian, Ill., Hoopeston, Ill., Racine, Wis., West Point, Ind., Sidney, Ill., Junction City, Kan., McConnellsville, O., Jermyn, Pa., Iowa City, Ia., West Liberty, Ia., Greenup, Ill., Monmouth, Ill., Milton Junction, Wis., Auburn, Ind., Kendallville, Ind., Nevada, Ia., Kempton, Ind., Topeka, Ind., Champaign, Ill., Burr Oak, Mich., Mt. Ayr, Ia., Columbus, Kas., Cerro Gordo, Ill., Manito, Ill., Attica, Ind., Duncan, Ind. Ter., Pekin, Ill., Wilkesbarre, Pa., Browns Valley, Ind., Anderson, Texas, Crawfordsville, Ind., Warren, Ark., Winterset, Ia., Cairo, Ill., Wolcottville, Ind., Monticello, Ind., Stockwell, Ind., Rochester, Ind., Marshall, Ill., and Lima, Ohio.

The company reports that it is unable to fill orders for its well-known protective devices and cable terminals, consequently is largely increasing the machine capacity so as to be enabled to cope with the rapidly increasing business. The company has recently added to its product something new in the way of a renewable fuse which is claimed to be practically indestructible. The body of this new article is made of black fibre, so creased that it can be folded in a book form. This body is tipped with copper. The fuse wire is soldered between the copper tips upon the inner side of the fibre folder. After being fused it is folded together and clamped with a portion of the copper tip. In this way the fuse wire is always enclosed in a slack form. It admits of cleaning, bending, twisting, or rough handling, without destroying the fuse.

In the operation of the fuse, in the case of electric current, the fuse wire only is destroyed. The folder can be reopened and new fuse soldered in place between the terminals.

"PARANITE" WIRE AND CABLE.

The Indiana Rubber and Insulated Wire Company of Jonesboro, Ind., report a heavy demand for its well-known "Paranite" brand of wires and cables. The company has added to its already well equipped factory some new insulating machines which will very much increase the daily output of telephone wires, and also a new cabling machine, which will be used exclusively for the manufacture of telephone cables. Especial attention is given to the manufacture of all styles of rubber-covered wires and cables used in the construction of telephone plants. The company's telephone cables, cuts of which are shown, have been on the market for the past ten years and are used by many of the leading telephone exchanges in the country. A contract for cable that will require over 2,000,000 feet of wire has recently been closed.



PARANITE TELEPHONE CABLES.

In addition to the manufacture of single and duplex wires and telephone cables the company manufactures a full line of electric light wires for underground, aerial, submarine and inside use. A sample card of "Paranite" will be sent postpaid to anyone upon request.

KENTUCKY TELEPHONE ASSOCIATION.

The third annual meeting of the Kentucky Telephone Association will take place at Owensboro, Ky., on Tuesday, October 8, 1901, 9 a. m., and will be in session two days, if the business requires it.

This will be the most important gathering in the history of the organization, and it is desired that all the members shall be present and make efforts to have every owner of an Independent exchange or toll line attend or send a representative.

Changes in the constitution will be suggested and acted upon and other matters having important bearing on the Independent situation in the state will be brought before the meeting for consideration.

OUR FRIENDS THE ENEMY.

PAPER READ BY MR. GEORGE P. HAYWOOD AT LAFAYETTE.

I have heard it said by those acquainted with the great American game that the man who is caught bluffing loses. There have been frequent illustrations of the truth of the above proposition within the last five years in the contest which has been going on between the Bell and the Independent people.

When the Independent movement in telephony started a few years ago the Bell Telephone Company, with its different branches, had become a giant monopoly, proud, arrogant, dictatorial. In its clutches grasping the entire country, it felt its fortifications were impregnable. It was, in fact, a giant of wonderful proportions, and it believed its strength sufficient to cope with all opposition. It not only by its patents controlled telephony throughout the country, but it so connected its personnel and its financial interests with other great corporations and moneyed concerns until there was between them such a mutuality of interest that you no sooner touched the interest of the Bell people than you were confronted by an unsuspected adversary, who therefore perhaps had been your friend. No sooner did you attempt to start the movement of an Independent telephone exchange than you were surprisingly confronted by the opposition of your neighbor, who happened to be an employe of the Western Union Telegraph Company, or of some railroad company, or a small stockholder of some branch of the parent company, or perhaps a retained lawyer of some railroad or other corporation. He would not only refuse to permit you to enlist him as a subscriber, but he at once began his neighborly and friendly functions of advising you that you must not proceed further, at the risk of losing your money and your reputation for common sense as well, for you are going up against the real thing, and your little company, in the way of the Bell, would only be as a fly speck on the map of the country. If that was not sufficient to scare you into submission, your other neighbors and friends, and the merchants and people of the city were seen, out of commiseration for you and in your behalf, and advised to have nothing to do with you, first, out of friendship for you; second, out of friendship for themselves, for the reason that you could not accomplish anything in the telephone business, because your apparatus was crude and worthless; thirdly, you could not procure competent help to even build, much less operate, an exchange, for all such competent help was controlled by the Bell people, and, lastly, should you attempt to use proper telephones and switchboards, you would be infringing the patents of the Bell, and not only you, but every subscriber, would be proceeded against for damages in the United States courts. Yes, think of it! Not in your own court at home, but carried away from home and into the courts of the United States!

If all this did not deter you and prevent you from building an exchange, you were sneered at during its construction. You were smiled upon with derision. Your friends were told that you would not be able to move a peg when your exchange would be completed, as you would be enjoined from proceeding to operate your exchange.

If you had the courage and manhood, pluck and energy, and built your exchange, and began its operation you were *not* enjoined. You were not interfered with by any honorable means. You did not have an honorable competitor in the field against you, but you had a competitor supposedly strong in financial resources, with nearly a quarter of a century's business built up to sustain it, with capable men, and men of large financial influence behind it to push it, yet this giant concern was not courageous enough, was not fair enough, was not honorable enough to meet you in open field and let merit win. Instead, the Bell people and their influences attacked you by a method which has been properly termed "guerilla warfare." They sought to crush you and drive you out of business by reducing the price, which, if you met, you could not succeed. They even went further and gave telephone service for nothing. This, of course, had you followed them, would have been ruinous to you. You could not afford to do it, and if you have succeeded in the Independent telephone business you have succeeded because you have stood by your rates as first established, continued with courage, energy and judgment the even tenor of your way, and you have succeeded far beyond your fondest expectations.

Such is a brief outline of the opposition which every Independent exchange has met during the last six years. It is said that competition is the life of trade. No man ought to object to honorable competition; no man or set of men is justified in resorting to dishonorable methods to compete with a rival. It seems strange indeed that a corporation so long established, with the ramifications of its business extending throughout the United States, with financial resources behind it, with the strong business connections that the Bell telephone has, could not honorably compete with the newly-born, unorganized and financially weak Independent telephone movement that commenced some six or seven years ago. It seems strange that the Bell people would stand by and simply bluff and threaten, and by such intimidation seek to drive from the field the Independent people. Many have marveled at this seeming stupidity on the part of the Bell people. A study of the history of the telephone litigation that has been going on for the last six or eight years, however, will reveal the reason for the course pursued by our adversaries. They expected by fraud and chicanery to continue their monopoly for many years to come, by procuring patents upon so-called new inventions, which were necessary to the use of the telephone business. They expected to succeed in this by their powerful influence and financial strength, and because of the weakness and unorganized condition of the Independent people. In this way they were defeated. They were met in their attempt to carry out this scheme by men worthy of their steel. The government of the United States, through its attorney-general, came to the assistance of the Independent people; that is, the government, to the extent just mentioned, took a hand in the litigation in order that no fraud should be perpetrated and that justice to all should be done.

While the Independent people were busy building exchanges and toll lines throughout the country, and especially in the middle West, and while the Bell people, throughout those different localities, were threatening and bluffing, the leaders of both parties were engaged in a great legal battle in the courts of our government. Had the Bell people succeeded in establishing its patents, and thus continuing its monopoly, financial ruin, quick and sure, would have been the only result to all Independent people, so far as the telephone business was concerned. There would have been foisted upon the people a continuation of the high prices and poor service that had prevailed with the Bell people before the Independent movement began. Too much praise cannot be given for those that came to the front and fought the battles for the people against this giant monopoly and won.

When we look back through the last half dozen years and reflect upon the many means used in opposition to the Independent movement, and consider our weakness and our unorganized condition, we can but wonder at the success we have attained. We owe much of this success to the loyalty of the people whose patronage we sought and obtained. They had not forgotten, and they will not soon forget, the extortions they had been subjected to for so many years by the Bell people, and the very service rendered them.

We also owe much of our success to the Bell people themselves, and in this respect the saying, "our friend the enemy," was never more aptly applied than to the Bell people. In every instance, so far as I have been able to ascertain, the old company, when threatened at any place with a new Independent exchange, not only continued its high prices, but continued its poor service, and neglected to put its exchange in proper condition, whereby good service could be rendered. While the new exchange was being built it so

continued; then as soon as the new exchange was in operation it cut its prices and frequently gave free telephone service. This to every thinking man was an acknowledgement of weakness of its position and the motive for doing so was so illy concealed that every reasonable man knew that if they should succeed in driving out of business the new exchange the old conditions of the Bell would be resumed. In a few instances they have succeeded by purchasing, or in some other manner getting rid of, the new company, and in every such instance they have gone back to their old methods and high prices. These facts have made sufficient warnings to the people and they have loyally stood by the Independent movement.

The success of the Independent people has been almost marvelous. Especially is this true in our state. For a quarter of a century the Bell people, through their franchises, have been doing business in this state. They now have in operation, as claimed by them, about twenty-two thousand telephones. The Independent movement is but six or seven years old; there are to-day in operation in the state of Indiana over fifty thousand telephones.

Speaking of local conditions: On the first of January, 1895, the Lafayette Telephone Company, then known as the Lafayette Harrison Telephone Company, commenced operations with three hundred telephones. It has run the gauntlet of obstructions and questionable tactics of the Central Union people, such as have been mentioned heretofore, even to having to compete with free Central Union telephone service. To-day there are about fifteen hundred telephones in operation in the Lafayette Telephone Company's exchange. It is not known definitely how many telephones are in use in the Bell exchange, but the number is small compared with that of the Lafayette Telephone Company. The best test of the usefulness and the strength of the two exchanges is found in the number of messages transmitted in a given time by each. It has been stated by persons using both the Bell and the Lafayette telephone in their place of business that at least ten messages come over the Lafayette lines where one comes over the Bell lines. This is the result of the Bell methods and the methods used by the Lafayette telephone people. While it is true that a few people will forsake the Independent exchange and their own best interest because of cheaper rates, or no rates at all, with the B[illegible] the large majority of people know the danger to themselves if there should be no Independent exchange in their city.

There are some few people who always expect others to bear their burdens; they are very willing that their burdens should be borne by others. Those few people will take advantage of the guerilla methods used by the Bell people and use their telephones because they can get them for less, or for nothing. Others, and the very large majority, with better judgment, are willing to pay a reasonable price for telephone service, and at the same time protect themselves from the future oppression of the Bell people. It is the duty of the managers of every Independent exchange, as well as all toll lines, to supply the people with the very best service. We owe it to ourselves and to the people who stand by us. It is to our interest to give such service because we thereby succeed. We owe it to ourselves and to the people who stand by us to thoroughly organize and stand together, to be faithful and true to each other and to the Independent movement. So long as we do this, we need have no fear, but can rest assured that further and greater success will reward our efforts.

The Keelyn Telephone Manufacturing Company, Chicago, has been reorganized and new capital added to the business. The company has just moved into the heart of the Chicago telephone manufacturing district and taken up permanent headquarters in the commodious building No. 165 South Canal street, near Jackson boulevard. Many improvements have been made and some desirable new specialties gotten up.

SOUTHERN ILLINOIS TELEPHONE MEETING.

The Independent Telephone Association of Southern Illinois met at Murphysboro, August 16, for the purpose of considering the connecting of its exchanges with the long-distance wires of the Kinloch Long-Distance Telephone Company of St. Louis. Other matters of importance to the association were discussed and such steps are to be taken as will facilitate and make more perfect the exchange of service between the exchanges of the association. The association consists of fourteen telephone companies, with between twenty-five and thirty exchanges, and its connections include every town of any importance in the southern part of the state. All of the exchanges are in a prosperous condition and are having a healthy growth. F. H. Stamper, a prominent business man of Benton, is president of the association, and the Hon. W. S. Cantrell is the attorney. The lessees of the Bell Telephone Company have made repeated efforts to break into the ranks of the association, but their offers of inducements as well as threats have alike failed.

A PHENOMENAL GROWTH.

The following article on the phenomenal growth of the telephone industry is taken from a booklet issued by the Trowbridge Niver Company, bankers, Chicago. Added weight is given to the statements made from the fact that the data is given out by a conservative banking institution and can therefore be depended upon as being reliable:

"The growth of the Bell and the Bell licensee telephone companies has been steady, and yet very rapid. It is only a quarter of a century since they entered the field, and to-day they have 2,300 exchanges and about 2,000,000 subscribers, but while their growth has been very rapid, it falls far short of the marvelous growth of the Independents.

"It is only seven years since the first of these companies began business. At first the opposition was very strong. Capitalists shunned them, subscribers hesitated, fearing that good service could not be secured and that the movement would not last, but gradually they have demonstrated that they are able to give, for about one-half the cost, just as good, and in most cases better, service than the old companies were giving, and that they were in the field to stay.

"In some instances the rates were too low for proper maintenance, but, notwithstanding this, the average net profit has been nearly twelve per cent per annum. This latter fact has so completely won the confidence of the capitalists that many instances are on record in which the capital stock and bond issues of the Independent companies have been oversubscribed two or three times, while the good service and lower rates have so told on the public that the statistics now before the writer (August 15, 1901) show there are 5,897 Independent exchanges (not including toll lines) and over 3,000,000 subscribers.

"In an article published in the Chicago Tribune, June, 1901, President John I. Sabin states that, while there is need of over 300,000 telephones in the Central Union District, his company has only 70,000 subscribers (the Central Union District includes Ohio, Indiana, Illinois, outside of Chicago, and extending into Eastern Iowa).

"Reliable statistics now at hand (August 15, 1901) show that Ohio alone has 493 Independent exchanges with an aggregate of 67,597 subscribers; Indiana has 427 exchanges, aggregating 52,496 subscribers.

Illinois has	507 Exchanges
Iowa has	440 Exchanges
Minnesota has	210 Exchanges
Michigan has	223 Exchanges
Missouri has	234 Exchanges
Wisconsin has	217 Exchanges
Pennsylvania has	407 Exchanges
New York has	426 Exchanges

"And so on, East, West, North or South there is no state or territory in the Union in which they are not represented, and, reaching over, they have invaded Mexico, Can-

ada, Alaska and Hawaiian Islands, and yet the work of construction goes on. New companies are formed almost every day, and 250 manufacturers of Independent telephones and telephone apparatus are being taxed to their utmost capacity to supply the demand. The average output from Chicago alone is about 4,000 Independent telephones per week.

"One Chicago firm received orders during the last three weeks from six of these new companies aggregating over $800,000 worth of telephones and telephone apparatus. The cost of construction of these six companies will be over four million dollars ($4,000,000).

"Independent companies are born of and supported by the people; their policy is a liberal one, their business methods aggressive, their tax upon the public is low (the lowest of any quasi-public corporation); therefore, during times of great financial depression, such as that experienced five or six years ago, when railroad and other securities were away down and construction had practically ceased, there was no shrinkage in telephone receipts and construction went steadily on.

"It is, therefore, clearly demonstrated that the securities of Independent telephone companies offer an investment remarkable for safety and stability."

TELEPHONE AUXILIARIES.

BY J. E. KEELYN.

It may truly be said that the telephone business is yet in its teens. Now that competition is active and permanent there begins to show more life and energy in it. The progressive telephone exchange manager will not fail to keep his system up to date in character of telephone service, while utilizing his plant and facilities to their utmost in revenue-deriving ways. There are many ways, very few of which have been put to practice. Thus far the telephone managers have applied themselves to a strictly flat rate, or message service system, of revenue earning. In only a few cases have "specialty rates" been adopted, where, for instance, the leading grocer or butcher can advertise himself or help his trade by leasing a large number of telephones on one circuit in connection with his store for order business only. This is profitable for the grocery or market and should be for the exchange. Boarding houses and small hotels or groups of outlying residences where telephones are little known have much trade for the grocery and market. Ten or twenty of these places on a private line service can be operated satisfactorily. A market can secure their exclusive trade cheaper by telephone than by "order wagon." Such trade averages about $25 per month business to grocery and market. A private service at $12 per annum should be profitable to the exchange. This is less than 5 per cent cost of selling goods to the merchant. The above is only illustrative, and may be varied as the circumstances of exchanges and patrons require. It is also only one "specialty" of very many applicable to direct telephone use.

However, a telephone exchange plant is not to be confined to telephones in revenue earning. The poles, arms, wires, cables, etc., can be put to many profitable uses in "auxiliaries." Only one "auxiliary" will be referred to at this time particularly, which may encourage managers to add to their exchange earnings. The "observatory time" clock system of the Western Union Telegraph Company is in use in many cities now equipped with "Independent" telephone exchanges. The standard minimum rate is $12 per annum per clock. This rate is held up by the Western Union Telegraph Company. Such a system can be installed for about $25 per clock by most local exchange companies. The cost of operating it is very little, and in most cases would not be felt in the expense account of Independent telephone exchanges. The profits are considerable. The writer is now installing such a system of fifty clocks in a city of about 12,000 inhabitants, for the local Independent telephone exchange company. The total cost of the system under the contract is $1,700, which includes $200 for setting up and expert services not usually necessary. In this town there were over forty Western Union clocks at rates of $1 to $2 per month each. The local company secured all but four of the Western Union patrons on three-year contracts at a minimum rate of $10 per annum, or 20 per cent less than the former rate. They have already added several new patrons, with prospects of many more. Some special large clocks for advertising purposes were ordered and paid for by patrons themselves. The manager of the company estimates that the present contracts assure paying interest on the investment and sufficient more to pay for the entire equipment within three years.

Another method of conserving the interests of telephone exchanges is found in "temporary" party line service. It is not always feasible to extend a conduit system or reconstruct and enlarge a pole line system or establish a new cable, for ten or a dozen "subscribers" in a new district. For the purpose of providing temporary service to subscribers in these cases until such time as the knowledge of the needs of the district may develop, managers should provide a party line service. It is not generally known, still it is a fact, that apparatus of good efficiency has been perfected that will perform satisfactory "party line" service with twenty telephones in one circuit. The only difficulty is in the "waiting" when the line is in use. Ordinarily, with the telephones, this will not be seriously objected to, if a reduced rate will be granted as an offset, which, of course, can be afforded. The operation of the system is private and non-interrupted when in use, and in calling over the line only the parties desired are "rung." This "temporary" service provides a revenue and keeps the patron from a competitor where it will not pay at once to install a new cable. In many instances, however, such a service would be permanently satisfactory, for instance, where the limit of subscribers on a long line does not exceed ten "moderately used" telephones.

AMERICAN PROSPERITY.

The American Electric Telephone Company, Chicago, has secured the contract for 8,000 No. 34 central energy telephones, 10,000 terminals and all other necessary protective devices for the Independent telephone exchange now being built in Philadelphia, Pa.

Harrisburg is another important city in Pennsylvania to adopt American apparatus, and the exchange will have 2,000-line capacity and provision for 3,000; two small adjoining towns will have 500-line exchanges each; Reading, Pa., 1,500 central energy, with 5,000 ultimate capacity.

In New Jersey, Trenton will have a 3,000 American central energy system. Ohio is well represented with Mansfield, common battery, 1,200 installed, with 3,000 ultimate capacity. Zanesville, Ohio, 1,500 common battery connected, with provision for 3,000. In Xenia, Ohio, the new exchange is running with 800 in operation, designed for 2,000.

Austin, Texas, has contracted for 1,200 central energy immediate connection, 3,000 ultimately. Temple, Tyler and Taylor, Texas, each 750 lines, central energy, ready to connect with double the capacity as subscribers increase in number. Belton, Texas, has bought a 500-line equipment for common return; can increase to 1,000.

Oklahoma City, I. T., has already 750 subscribers on a 1,200-line central energy switchboard. Topeka, Kans., will install 1,200 lines at once and provide for an increase up to 3,000. Rhinelander, Wis., will start with nearly 750 subscribers on a 1,200-line board. In Illinois, Pekin will have a 750 to 1,200 line exchange, while in Huntington, Ind., a 1,000-line equipment is contracted for and construction under way.

"TELEPHONY is the best paper that has ever appeared in my office for the telephone people. It's too good for the price you furnish it.

CALVIN LIGGETT, Sec.,
Home Telephone Co.,
Plain City, O."